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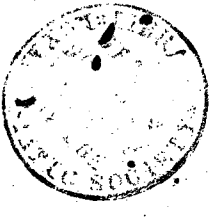
THE

ROMANS UNDER THE EMPIRE.

VOL. V.



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HISTORY

OF THE

ROMANS UNDER THE EMPIRE

BY THE VERY REV.

CHARLES MERIVALE, D.C.L.

DEAN OF ELY.

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HISTORY

OF THE

ROMANS UNDER THE EMPIRE.

CHAPTER XL.

The great cities of the Roman empire.—The cities of Greece: Corinth, Sparta, Athens, Delos.—The cities of Asia: Ephesus and others.—Antioch in Syria.—The Grecian cities in Italy: the cities on the Campanian coast.—Approach to Rome.—The hills of Rome.—The valleys of Rome.—The Forum, Velabrum, &c.—The Transtiberina.—The Campus Martius.—The streets and domestic architecture of Rome.—The Domus and Insulæ.—Population estimated: 1. From the area of the city. 2. From the number of houses. 3. From the number of recipients of grain.—Concluding remarks.

The idea of the city first absorbed in that of the empire under the Cæsars.

THE progress of the Greeks and Romans in the arts of peace and civilization may be ascribed in a great measure to the skill they early attained in self-defence. When assailed by a superior foe whom they were unable to meet in the field, they withdrew behind the shelter of their walls, constructed for the permanent security of their temples and dwellings, and derided from the heights of their airy citadels the fruitless challenge of the adversary who pined inactive beneath them. Hence the political importance which the city, the place of common refuge, the hearth of the national gods, the stronghold of national independence, acquired among them, and the comparative insignificance to which they resigned their domains and villages, which they held themselves ever ready, at the first sign of invasion, to abandon to the enemy.

Even when their conquests extended far and wide over islands and continents, Rome and Athens, Syracuse and Sparta, still continued, unlike England and France, Russia and Turkey, in modern times, to be the names of cities, rather than of countries; all political privileges centred in them, and flowed thence with slow and measured pace to the more favoured of their subject communities. It is to this principle of their polity that we owe much of the intense national life, the deep-marked lines of national character, of faith, manners, and opinions, which severally distinguished them, and which seem to have received their form and pressure from the mould of the city walls in which they were first fused together. We have seen, however, in the last chapter, how the exclusive pretensions of the greatest of these conquering cities were eventually modified by the exigencies of a wide-extended sovereignty. The Roman empire claims at last, the first in civilized antiquity, to be considered as in itself a political body, independent of its connexion with Rome, the residence of its chief governor. Our history becomes a review of the affairs of a vast unit, the aggregate of a multitude of smaller members, the sum of many combined elements. The title affixed to it, the History of the Romans rather than of Rome, may serve to mark this important feature in its character; and accordingly it seemed most fitting to commence our survey of the condition of the Roman people under Augustus with a general view of the empire itself, and the social and political bands by which it was held together and compacted into one system. I have reserved for a second chapter the more special examination of the features of the illustrious city from which it must still derive its chief interest, as well as its celebrated name.

Before entering, however, on this survey of the Eternal City, we will pass in rapid review the most

conspicuous of her rivals in fame and splendour, such as they appeared at this period of eclipse, if not of degradation. The grandeur of Rome, great and striking as it must seem in itself, may not disdain to borrow additional lustre from comparison with her noblest contemporaries.

Proposed survey of the city itself, as compared with the other great cities of the empire.

No Roman traveller of gentle birth and training could enter the precincts of an Hellenic community, and fail to imbibe a portion of the sacred glow with which it regarded the beautiful in the world either of sense or imagination. The young patrician, sent forth to acquire lessons of taste or wisdom at Rhodes and Athens, returned to his own rude Penates an altered man. A citizen who had visited Greece might be recognised, no doubt, in the Via Sacra almost at sight. He had worshipped in the temple of a real divinity; he had been initiated into the genuine mysteries of nature; he had received illumination from above. Yet the Greece which he had traversed and admired, though still full of restless stir and motion, still occupied upon thoughts that never die, and forms that never tire, was *living Greece* no more: she was the shadow of her former self, the ghost of her ancient being, still lingering among the haunts of her pride and beauty, more attractive perhaps to the imagination than in the bloom of her living existence. He had threaded, perhaps, with Cicero's graceful friend, the narrow channels of the Ægean, crowned by the Athenian acropolis. Behind him had lain Ægina, before him Megara, on his right the Piræus, Corinth on his left.[1] It was indeed a scene of mournful recollections. Ægina, the handmaid of haughty Athens, had shared her latest disasters, but had never revived with her recent renovation. Me-

The cities of Greece under Augustus.

Ægina and Megara.

[1] See the famous consolations of Sulpicius to Cicero (*Div.* iv. 5.), written in the year 709.

gara, the fatal cause of the great war of the Peloponnesus, had sunk into a state of decay and insignificance in which she could no longer tempt an unhallowed ambition. The sight of Corinth, still desolate and in ruins, might awake a painful remembrance of the sack of Mummius, the most shameful page in the annals of Roman devastation; while the Piræus reflected still more recent traditions of outrage, when Sulla wreaked on her the vengeance which he affected to spare to the venerable glories of Athens. No spot on earth could read the Roman moralist a more instructive lesson on the vanity of human greatness, or display to him more melancholy trophies of the lust of rapine and conquest.

Corinth and the Piræus.

Such mementos might have their use and appropriateness as addressed to a child of the capitol and the forum on crossing the threshold of illustrious Greece; but we are not to infer from them that decay and misery had fallen as a blight upon the whole realm of Hellas. Corinth herself was at that moment about to rise from her ashes under the auspices of a generous Roman, and to take her place once more among the most distinguished of cities. Her position, in respect to commerce and navigation, was not less admirable than that of Alexandria or Constantinople; and nothing but the deliberate pressure of a conqueror's arm could keep her permanently prostrate. Placed at the head of two almost commingling gulfs, and commanding by them the commerce of Italy and Asia, which shrank in conscious imbecility from the stormy navigation of the Malean Cape, Corinth, restored to life and freedom by the decree of Julius Cæsar, entered at once on a new career of prosperity, in which she was destined speedily to outstrip the fame of her earlier successes. It is probable indeed that some of her chief buildings and temples had

Restoration of Corinth by Julius Cæsar.

survived, though defaced and desecrated by the ruthless Mummius.[1] A squalid and degraded population still crouched under their shelter; but these poor wretches gained their livelihood, not by returning to the pursuits of commerce, which were checked by wars and piracy, and the now triumphant rivalry of Rhodes and Delos, but by groping among their ruins for the buried remnants of Corinthian bronze which had escaped the cupidity of the first captors, and had since become of priceless value.[2] The restoration of Corinth was one of Cæsar's noblest projects, and he was fortunately permitted to accomplish it. In gratitude for his services the new inhabitants gave it the name of the *Praise of Julius*.[3] But the lazy plebeians of Rome had shown no inclination to earn wealth by industry; no mercantile community could have sprung from the seed of the licentious veterans. The good sense of the dictator was strongly marked in his disregarding the prejudices of his countrymen, and transplanting to his new establishment a colony of enfranchised slaves.[4] Corinth rapidly rose under these auspices, became a centre of commerce and art, and took the lead among the cities of European Hellas. Here was established the seat of the Roman government of Achaia, and its population, though the representations we have received of it are extravagant, undoubtedly exceeded that of any Grecian

[1] This, it seems, may be inferred from the way in which Pausanias, in his account of Corinth, speaks of these edifices as *monuments* of antiquity.

[2] Comp. Strabo, viii. 6. p. 381.; Plin. *Hist. Nat.* xxxiv. 2., xxxvii. 3.; Stat. *Sylv.* ii. 2. 68.: "Æraque ab Isthmiacis auro potiora favillis." Cicero (*Tusc. Disp.* iii. 22.) laments the indifference these people evinced to their degraded condition. He was more moved by the sight of their ruins than they were themselves: "Magis me moverunt Corinthi subito aspectæ parietinæ quam ipsos Corinthios, quorum animis diuturna cogitatio callum vetustatis obduxerat."

[3] "Laus Julia" upon the medals. Eckhel, ii. 238.

[4] Strabo, viii. 6. p. 381.; Pausan. ii. 1, 2.; Plut. *Cæs.* 57.; Dion, xliii. 50.; Plin. *Hist. Nat.* iv. 4; Crinagoras in *Anthol. Gr.* ii. 145.

rival.[1] The beauty of its situation, the splendour of its edifices, the florid graces of its architecture, and the voluptuous charms of its parks and pleasure-grounds, delighted the stranger whom its commerce had attracted. The security it now enjoyed allowed it to expand its ample streets far beyond the precincts of its defences, and the light and airy arcades which connected it with its harbour at Lechæum might be advantageously contrasted with the weary length of dead wall which extended from Athens to the Piræus.[2]

Sparta favoured by Augustus.

The restoration of Corinth exalted her to higher eminence in every respect, except historic fame, than either of the rivals who had formerly outshone her. Of these, indeed, Sparta, in the days of Augustus, had fallen almost to the lowest depths of humiliation. Enjoying no advantages of position, she had suffered more than her share in the general decline of the Grecian cities after their loss of independence. In the late troubles, however, she had prudently sided with Octavius, while Athens was dazzled by the more brilliant pretensions of Antonius. She had been rewarded with the boon of immunity from Roman taxation, as well as self-government, and these privileges she continued to retain.[3] But at the same time she was allowed to

[1] Comp. Apuleius, *Metam.* x. p. 247.; Hierocles, p. 646.: Κόρινθος μητρόπολις πάσης Ἑλλάδος. Athenæus (vi. 20.) declares that its slaves amounted to 460,000. This number may bear perhaps to be shorn of its last figure; but we may as well suspect exaggeration in the writer as corruption in the MSS.

[2] Stat. *Sylv.* ii. 2. 25.:

> "Qualis ubi subeas Ephyres Bacchеidos altum
> Culmen, ab Inoo fert semita tecta Lechæo."

There was more than one such "via tecta" for the convenience of shade at Rome. At a much later period such an arcade ran from the Lateran gate to the basilica of St. Paul, and one structure of the kind now leads from Bologna to a favourite shrine some miles distant.

[3] Strabo, viii. 5. p. 365.: ἐτιμήθησαν διαφερόντως, καὶ ἔμειναν ἐλεύθεροι,

exercise no supremacy over the descendants of her Helots and Periœci, who retained, under the name of free Laconians, complete independence of her authority in four-and-twenty townships along her coasts; and of the hundred burghs she boasted in the days of her prosperity, she could now count no more than thirty, all of which were sunk in squalid insignificance.

Nevertheless in this reverse of fortune, the Spartans could still vaunt themselves genuine children of the Dorian heroes, who had conquered the sons of Hercules, and made themselves more than once the tyrants of the Hellenic world. Did their ancient rivals the Athenians venture to put forth similar pretensions of race and pedigree, they were met with a contemptuous smile from the rest of Greece and the enlightened all over the world, who well knew how little of pure Attic blood really flowed in their veins. The genuine race of Cecrops, the earth-born Eupatrids, had long mingled with strangers, before the fatal massacre of Sulla, which almost exterminated them. The edifices of their city, which the Roman general deigned to leave standing, were now repeopled by a motley crowd of immigrants from all parts.[1] With the name, however, of Athenians, these new citizens inherited the pride of their presumed ancestry. They paraded a spirit of independence even before the fasces of the prætor, refusing, when urged by one Roman consular, to allow sepulture within their walls to another, and declining to repeat the cele-

The Athenians debased in blood.

πλὴν τῶν φιλικῶν λειτουργίων ἄλλο συντελοῦντες οὐδέν. Comp. Plin. *Hist. Nat.* iv. 5: "ager Laconicæ gentis." Pausan. iii. iv.

[1] Cic. *Orat.* 44.: "Athenis mos est quotannis laudare in concione eos qui sunt in prœliis interfecti, recitato Platonis Menexeno" Tacitus (*Ann.* ii. 55.) tells how the pride of Rome rebuked these pretensions: "quod contra decus Rom. nominis non Atheniensis *tot cladibus exstinctos*, sed colluviem omnium nationum comitate nimia coluisset."

bration of their mysteries at the solicitation of Crassus.[1]

The splendour of the old Athenian glory still cast a mild declining ray over the land of Phœbus and the Muses; but the most accomplished of its foreign votaries could not but observe, that in his time the home of science and letters was more justly appreciated by strangers than by its own degenerate citizens.[2] Strangers indeed still continued to flock to it, and none were so numerous, none such enthusiasts in admiring it, as the sons of its Italian conquerors. The contemporaries of Cicero fully recognised the fact that the fame of ancient Hellas was mainly a reflex from the preeminent glory of Athens.[3] The jealousies of ancient rivals were extinguished in their common humiliation, and the men of Rhodes and Sparta regarded Athens as the last prop of their national renown, and sought the honour of enrolment among her citizens.[4] The noblest of the Romans were fain to follow this example. In vain did Cicero remind them of a principle of their own law, better known, perhaps, to constitutional antiquarians than to practical jurists, that every Roman who inscribed his name on the rolls of another republic, thereby forfeited the privileges of his own.[5]

Architectural splendour of Athens.

With the destruction of the Piræus by Sulla the commercial ascendancy of Athens had suffered an eclipse whence it never again emerged. In the time of Augustus her naval arsenal had dwindled into a small straggling

[1] See the letter of Sulpicius on the death of M. Marcellus. Cic. *ad Div.* iv. 12. 5.; and comp. Cic. *de Orat.* iii. 20.

[2] Cic. *de Orat.* iii. 11.: "Athenis jam diu doctrina ipsorum Atheniensium interiit, domicilium tantum in illa urbe remanet studiorum, quibus vacant cives, peregrini utuntur."

[3] Cic. *Brut.* 13. . . . "dicendi studium non erat commune Græciæ sed proprium Athenarum."

[4] Cic. *pro Flacc.* 26.: "Auctoritate tanta est, ut jam fractum et debilitatum Græciæ nomen hujus urbis laude nitatur."

[5] Cic. *pro Balb.* 12.

village, and the three state galleys which she still maintained, like the Bucentaur of falling Venice, merely preserved the tradition of her former greatness.[1] Nevertheless, though shorn of the resources of industry and independence, the splendour of the illustrious city was maintained by the pious veneration of her foreign visitors, who regarded her not unjustly with a feeling akin to religious. The Athens of the Augustan era might still, perhaps, claim to be the finest city in the world. Since the fall of her liberty 300 years before, kings and potentates had vied with one another in embellishing her streets and public places; and if she presented, like more modern cities, no capacious squares or long vistas lined on either side with superb edifices, it was owing to the unevenness of her original site, and the scruples which had spared her narrow and tortuous lanes in so many capitulations. The great temple of Zeus Olympius, first designed by the dynasty of Pisistratus, had risen, column after column, under Antiochus Epiphanes, and having been partially spoiled by Sulla, was carried on almost to completion by the joint efforts, already commemorated, of many royal associates.[2] Attalus, king of Pergamus, had crowned the walls of the Acropolis with statues. Ptolemy Philadelphus had erected a magnificent gymnasium. The groves of Academus which Sulla had cut down

[1] Strabo, ix. 1. p. 395. Athens contributed all her remaining forces to the cause of Pompeius, retaining only the three official galleys, Theoris, Paralus, and Salaminia, the last tokens of her ancient glory. Lucan, iii. 381.:

"Exhausit veteres quamvis delectus Athenas,
Exiguæ Phœbea tenent navalia puppes;
Tresque petunt veram credi Salamina carinæ."

The passage is crabbed, and there is no satisfactory explanation to be given of the word *Phœbea*. None of the Athenian havens was consecrated to Apollo, but the Munychia had a temple of Diana.

[2] Livy (xli. 20.): speaks of it perhaps before the undertaking of the confederate potentates: "templum Jovis Olympii unum in terris *inchoatum* pro magnitudine Dei."

to construct machinery for his siege were planted anew in the regin of Augustus, and continued for many ages to furnish a shade to sophists and rhetoricians. The walls of Athens, however, once overthrown, lay henceforth in ruins. The weakness of the city of Minerva became now her best defence. Both Julius and Augustus contributed to the erection of a portico dedicated to the goddess, and Agrippa placed his own statue, together with that of his imperator, upon a single pedestal by the side of the Propylæa of the Acropolis. A temple of Rome and Augustus was erected before the eastern front of the Parthenon. The munificence of a private benefactor, the censor Appius Claudius, had decorated the hamlet of the Attic Eleusis; and we may indulge, perhaps, in the idea that Cicero himself displayed his gratitude to his Alma Mater by dedicating to her a votive memorial within the precincts of the Academy.[1]

Cultivation of art and letters at Athens.

Exempt from the direct control of a Roman officer, the university of Athens was governed by a senate and assembly of its own. It was permitted to retain its ancient laws, and the august tribunals, such as the Areopagus, which had continued for so many ages to administer them. Under the shadow of the free republic of thought and letters, art, science, and philosophy were still taught and cultivated. The professors of ethics and physics, of oratory and grammar, still held forth to admiring audiences, each in his own lecture-room; every theory had its special teacher, every paradox its sworn defender; but strangers flocked to Athens, not to ascertain the truth from the collision of minds, but to hear how the doctrines of Epicurus were modified by Patro, how Phædrus handled the dialectics of Zeno, or what

[1] Cic. *ad Att.* vi. 1. 26.: "Audio Appium προπύλαιον Eleusine facere: num inepti fuerimus si nos quoque Academiæ fecerimus? Equidem valde ipsas Athenas amo: volo esse quoddam monumentum."

was the latest qualification of the doubts of the Academy.[1] The place of the poets had been taken by lecturers on poetry: but versification still had its votaries, and the epigram's *humble plot of ground* was cultivated at least with exquisite taste. The arts of sculpture and architecture had long lost their originality and simplicity; yet there was no department of excellence in which the genius of Greece seemed so nearly inexhaustible as in these.[2]

Commercial emporium of Delos.

The destruction of Corinth by the Romans had driven the commerce of Greece to the Isle of Delos, which, besides the convenience of its situation at the entrance of the Ægean, enjoyed the advantage of a reputation for special sanctity. It was the natural emporium of four seas, and offered an interchange between the products of Greece and Asia, Libya and Sarmatia. It became the centre of the slave trade of the ancient world, the most constant, and perhaps the most extensive, of all traffics. The piracy of the Mediterranean, which threatened to sweep away all other maritime employments, was the feeder and sustainer of this. Hither it converged in its regular and legitimate course from Thrace and Pontus on the Euxine, from Phrygia and Caria, from Egypt and Cyrene; even

[1] Propert. iii. 21.:

"Inde ubi Piræi capient me litora portus,
Scandam ego Theseæ brachia longa viæ.
Illic aut spatiis animum emendare Platonis
Incipiam, aut hortis, docte Epicure, tuis.
Persequar aut studium linguæ, Demosthenis arma,
Librorumque tuos, munde Menandre, sales;
Aut certe tabulæ captent mea lumina pictæ,
Sive ebore exactæ, seu magis ære, manus."

[2] Enthusiasts for Grecian art, such as Visconti, have maintained that its excellence in sculpture lasted without decline for six centuries. On the other hand, Velleius Paterculus asserts the famous paradox, "Eminentissima ingenia in idem arctati temporis spatium congregari," and illustrates it by the assumed confinement of the excellence of all arts in Greece within the limits of a single generation. Vell. i. 16, 17.

the cities of European Hellas furnished a class of victims, selected for the beauty of their persons or the refinement of their manners. But wherever piracy was in the ascendant, captives from every coast, and even noble Romans among them, were wafted to the great depôt of Delos, and transferred without remorse to the dealers who awaited their arrival.[1] Not less than 5,000 slaves had thus been bought and sold in a single day. But the prosperity of the guilty island was more shortlived than even the crimes on which it throve. The pirates were still roaming the seas with impunity when the wealth of Delos tempted the cupidity of Menophanes, one of the captains of Mithridates, by whom it was stormed and ransacked.[2] Its commercial eminence migrated to the securer stronghold of Rhodes, which had the singular good fortune to escape the sword both of the Romans and their adversaries. The ruin of Delos was consummated by the restoration of Corinth; and in the age of Augustus it still lay prostrate, nor did it ever again recover a portion of its earlier importance.[3]

Cities of Asia:

Notwithstanding many vexatious restrictions on the natural course of trade imposed by fiscal ignorance, the unity of the Roman empire conspired on the whole to restore commerce to its legitimate channels. The spot on the Asiatic coast which corresponded most nearly with Corinth on the European was Ephesus, a city which, in the time of Herodotus, had been the start-

Ephesus.

[1] After the suppression of the Cilician piracy, the practice survived of kidnapping free men and selling them into slavery. Cicero (*de Off.* ii. 16.) praises the benevolence of those who redeemed the victims of the crimps or corsairs. Even in Italy, during the civil wars, free men were seized by armed bands and carried into the ergastula of the great proprietors. Both Augustus and his successor attempted to remedy this violence (Suet. *Oct.* 32., *Tiber.* 8): nevertheless the crime continued. Senec. *Controv.* x. 4. The *Digest*, xxxix. 4., recognises the existence of freemen made slaves.

[2] Cicero, at a little later period still, contrasts the security of Delos with the dangers of Italy, and even the Appian Way, under the reign of maritime piracy. *Pro Leg. Manil.* 18.

[3] Strabo, x. 5. p. 486.

ing-point of caravans for Upper Asia, but which, under the change of dynasties and ruin of empires, had dwindled into a mere provincial town. The mild sway of Augustus restored it to wealth and eminence, and as the official capital of the province of Asia, it was reputed to be the metropolis of no less than 500 cities.[1] It shared with Smyrna, Pergamus, and Nicæa the honour of erecting a temple to the emperor. Apamea, in Phrygia, the centre of trade with the interior, was reputed the second commercial city in the peninsula. Synnada was celebrated for its variegated marbles, Laodicea for its woollens and tapestries, Hierapolis and Cibyra, the first for its dyes, the second for its iron manufactures. To these may be added the commercial activity of Miletus, and the royal magnificence of decoration which distinguished Cyzicus, Sinope, and Cnidus, in each of which kings had once resided.[2] These numerous hives of population were supported, not only by the exchange of their industry for foreign articles, but by the abundant fertility of the soil around them: the plains of Sardis and the valleys of the Caicus, the Hermus and the Cayster, were remarkable for their harvests, and the wines of Asia were among the choicest in the world.[3]

Apamea, Synnada, Laodicea, Cibyra.

Miletus.

Such was the condition of the most famous cities of the old world, reviving under the exercise of their native usages, or protected by the vigilance and equity of a strong metropolitan administration. There was, however, another class of cities in the East, of more modern origin

Cities of Macedonian origin in Asia.

[1] Eckhel, *Doctr. Numm.* ii. 559. &c.; Ulpian. *de Off. Procons.* in *Digest.* iv. 5.; Strabo xiv. 1. p. 640. fin.

[2] Strabo, xii., xiii.; Joseph. *Bell. Jud.* ii. 16. § 4.

[3] Strabo, *ll. cc.* For the natural resources of Asia, the rapidity with which it recovered its losses by war and tyranny, and the importance of its revenues to the empire, see particularly Cicero, *ad Qu. Fr.* i. 1. and *pro Leg. Manil.* 6. *ad Att.* vi. 2.

and character, of which it will be sufficient to notice one specimen. The Macedonian rulers of the East were a race of builders. After the manner of the kings and satraps to whom they succeeded, they fed their pride by sweeping the inhabitants of towns and villages into cities laid out with pomp and splendour, on sites the most convenient and commanding, to which they gave their own names, or those of their kinsmen or consorts. Antioch flourished on the fall of Tyre. It was erected by Seleucus Nicator, the greatest of all builders of the class, on the banks of the Orontes, about fifteen miles from the sea, in a plain celebrated for the beauty of its climate, the abundance of its water, and consequent fertility. It was laid out, after the usual type of the Macedonian cities, on a symmetrical plan, the chief street being a straight line four miles in length, bordered throughout with double colonnades. Four cities, contiguous to one another, coalesced into a single metropolis; but, from some inequality of ground or other cause, the common arrangement of two transverse streets was not adopted at Antioch.[1] The character of Grecian architecture, with its indefinite prolongation of horizontal lines, its regularity of outline, and constant repetition of similar forms, must have given a peculiar air of magnificence to this style of construction, and conveyed an impression of the enormous power of the hand which could thus strike out as it were at one blow a fabric capable of infinite extension in every direction. Antioch contained, we are told, in the third century, 300,000 free citizens, and was then surpassed in numbers only

Antioch.

[1] Strabo, xvi. 2. p. 750. See the description and map of Antioch from Malelas and Libanius, in Lewin's or Conybeare and Howson's *Life of St. Paul.* Nicæa, mentioned above, should be included among the cities of Macedonian origin. Strabo describes it as a square of sixteen stadia in circumference, divided into equal rectangles by two straight avenues, so that the four gates could be seen from a pillar in the public place in the centre. Strabo, xii. 4. p. 566.

by Rome and Seleucia on the Tigris. Alexandria perhaps nearly equalled it, but every other city throughout the world yielded to it the palm of grandeur and population.[1]

The Grecian cities of Syria, and Antioch at the head of them, were notorious for their luxury and voluptuousness: and the idle and dissolute native, relaxed by long servitude to his kings and priests, received the polish of Hellenic culture only to make his degradation more conspicuous. The refinements of Grecian life had found a home also on the fairest shores of Italy, and had exercised no less debasing influence on the sterner character of the Romans themselves. From ages long lost in the darkness of legendary history, settlers from Greece had established themselves on the coast of the Tyrrhene or Sicilian Sea: hill and headland, pool and river, village and city, had received from them a Grecian appellation, and had been admitted within the hallowed circle of their national traditions. Misenum and Leucosia, Posidonia and Cumæ, Acheron and Avernus, Neapolis and Herculaneum, attested the ancient settlement of the Greeks on the coast of Campania; while cities of native growth, such as Baiæ and Stabiæ, Surrentum, Pompeii and Salernum, grew up by the side of the foreign colonies, and partook of their splendour and prosperity.[2] From the period of the conquest of this region by the Romans, its beauty and salubrity had attracted their notice; the medicinal qualities of its

Greek cities in Italy.

[1] Herodian, iv. 5. ἢ τὴν Ἀντιόχειαν ἢ τὴν Ἀλεξάνδρειαν, οὐ πολύ τι τῆς Ῥωμης, ὡς φέρετο, μεγέθει ὑπολειπούσας. Seleucia on the Tigris was built also by Selencus Nicator. In the time of Pliny it was supposed to contain 400,000 free inhabitants (Plin. *Hist. Nat.* vi. 36.), although the Parthians had built Ctesiphon by its side to rival and control it. I suspect that Pliny's estimate applies properly to the two cities conjointly

[2] Pæstum was the Italian name of Posidonia, Puteoli of Dicæarchia, which eventually prevailed over the Grecian.

warm vapours and sulphureous springs were appreciated by them; while the mountains which encircled it had not yet revealed their latent fires, or the activity they may have displayed in remote ages was remembered only in obscure traditions.[1]

The life of the Romans on the Campanian coast.

Roman imperators, from the time of the Scipios and the Gracchi, had sought repose in this favoured tract: on the heights of Misenum Hortensius and Lucullus, Cæsar and Pompeius, had erected their villas, their camps, as Seneca would rather call them, from the dignity of their position, and the wide prospect they commanded.[2] The cities which lined the gulf or crater embraced by the sweeping arms of Misenum and Surrentum, were governed by Grecian laws, and surrendered to the sway of Grecian usages and customs. To them the Roman, wearied with the ceaseless occupations and rigid formality of life at Rome, gladly retired for bodily relaxation, to be ennobled, as he might pretend, by intellectual exercises. Neapolis had its schools and colleges, as well as Athens; its society abounded in artists and men of letters, and it enjoyed among the Romans the title of the learned, which comprehended in their view the praise of elegance as well as knowledge.[3] Every fifth year the festival of the Quinquennia was celebrated with athletic contests in the arena; in its theatre the genteel comedy

[1] It has been conjectured that the Homeric or Phœnician tradition, that here were the ends of the earth covered with Cimmerian darkness, was derived from the reports of navigators, who had found the sun obscured by volcanic smoke and ashes, such as have been known to extinguish the light in Iceland for months together.

[2] Seneca, *Ep.* 51.: "Videbatur hoc magis militare ex edito speculari late longeque subjecta. Adspice quam positionem elegerunt, quibus ædificia excitaverunt locis et qualia: scias non villas esse sed castra." It is curious that the vast remains of the Lucullan substructions, grottoes, and arcades, received in the middle ages the name of Castrum Lucullanum.

[3] Columell. x. 134.: "Docta Parthenope." The epithet implies, besides mere knowledge, the polish and refinement of manners imparted by a liberal education.

of the school of Menander combined in due proportions the decorousness of Rome and the licence of its native country.[1] Here the patrician might throw off the toga, the sandal and the cap, and lounge in a trailing robe barefooted, his head lightly bound with the Oriental fillet, attended at every step by obedient slaves and cringing parasites, but relieved from the gaze of clients and lictors, from the duty of answering questions and the necessity of issuing commands.[2] Such was the indolent life of the Romans at Neapolis and its neighbour Palæpolis; such it was at Herculaneum and Pompeii. But Baiæ, the most fashionable of the Roman spas, presented another and more lively spectacle. Here idleness had assumed the form of dissipation, and the senator displayed as much energy in amusing himself as he had elsewhere shown in serving his country or promoting his own fortunes. As soon as the reviving heats of April gave token of advancing summer, the noble and the rich hurried from Rome to this choice retreat; and here, till the raging dogstar forbade the toils even of amusement, they disported themselves on shore or on sea, in the thick groves or on the placid lakes, in litters and chariots, in gilded boats with painted sails, lulled by day and night with the sweetest symphonies of song and music, or gazing

[1] Stat. *Sylv.* ii. 5. 89.:

"Quid nunc magnificas species cultusque locorum,
Templaque, et innumeris spatia interstincta columnis;
Quid geminam molem nudi tectique theatri,
Et Capitolinis Quinquennia proxima lustris;
Quid laudem risus libertatemque Menandri,
Quam Romanus honos et Graia licentia miscent?"

It must be observed, however, that the Quinquennial games of Neapolis were an institution of Domitian, seventy years after Augustus.

[2] Cicero, *pro Rabir. Post.* 10.: "Deliciarum causa et voluptatis non modo cives Romanos sed et nobiles adolescentes, et quosdam etiam senatores, summo loco natos, non in hortis et suburbanis suis, sed Neapoli in celeberrimo oppido, cum mitella sæpe vidimus." See in the same place what scandal might be caused by the use of the pallium.

indolently on the wanton movements of male and female dancers. The bath, elsewhere their relaxation, was here the business of the day: besides using the native warm springs and the vapours which issued from the treacherous soil, they turned the pools of Avernus and Lucrinus into tanks for swimming; and in these pleasant waters both sexes met familiarly together, and conversed amidst the roses sprinkled lavishly on their surface.[1]

But I have brought the reader from the provinces to Italy: I now assume the graver task of introducing him to Rome.

Approach to Rome.

From whichever side of Italy the stranger approached the imperial city, he emerged from the defiles of an amphitheatre of hills upon a wide open plain, near the centre of which an isolated cluster of eminences, moderate in height and volume, crowned with a vast assemblage of stately edifices, announced the goal towards which for many a hundred miles his road had been conducting him.

The roads.

There were two main routes which might have thus led him from the provinces to the capital, the Appian from Greece and Africa, and the Flaminian from Gaul; but the lines of the Servian wall, which still bounded Rome in the age of Augustus, were pierced with eighteen apertures, each of which admitted a well-appointed road from the nearer districts of the peninsula. The approach to the greatest of cities was indicated also by works of an-

[1] For the amusements of Baiæ see Tibullus, iii. 5.; Martial, iv. 57., x. 30., xi. 80.; Ovid, *Art. Amand.* i. 255.; and especially Seneca, *Ep.* 51.: "Videre ebrios per litora errantes, et comissationes navigantium, et symphoniarum cantibus perstrepentes lacus . . . præternavigantes adulteras dinumerare, et aspicere tot genera cymbarum variis coloribus picta, et fluitantem toto lacu rosam, et audire canentium nocturna convicia." He also calls it, more compendiously, "diversorium vitiorum." Ovid, *l. c.*:

"Hinc aliquis vulnus referens in pectore dixit:
Non hæc, ut fama est, unda salubris erat."

other kind, the most magnificent and imposing in their character of any Roman constructions. In the time of Augustus seven aqueducts brought water from distant sources to Rome. Some of these streams indeed were conveyed underground in leaden pipes throughout their whole course, till they were received into reservoirs within the walls, where they rose to the level required for the supply of the highest sites. Others, however, entered the city on a succession of stone arches, and of these the Aqua Marcia, which was derived from the Volscian mountains, was thus sumptuously conducted for a distance of 7000 paces before it reached the brow of the Esquiline Hill.[1] These monuments of the pomp and power of the people to whose wants they ostentatiously ministered, were rendered the more impressive from the solitudes in which for many miles they planted their giant footsteps. The Campagna, or plain of Rome, at the present day the most awful image of death in the bosom of life anywhere to be witnessed, was already deserted by the swarms of population which three centuries before had made it the hive of Italy. The fertile fields of the Hernici and Æqui had been converted into pasture land, and the cultivators of the soil, once the denizens of a hundred towns and villages, had gone to swell the numbers of the cities on the coast. Even the fastnesses in the hills had been abandoned in the general security from external attack; while the patrician villas, with which central Italy was studded, were buried in the shade of woods or the cool recesses of the mountains. For many months, it may be added, the heat was too oppressive for journeying by day, whenever it could be avoided; the commerce of Rome was chiefly carried on by means of the river[2]; and the

The aqueducts.

Solitude of the country round Rome.

[1] Strabo, v. 3.; Plin. *Hist. Nat.* xxxi. 3 24. Corrected by Frontinus in his special treatise of the aqueducts, c. 7.

[2] There are picturesque allusions to the movement on the river in

necessities of warfare no longer required the constant passing and repassing at all hours of soldiers, couriers, and munitions. The practice of riding by night seems to have been generally adopted, so that the movement on the roads gave little sign by daylight of the vicinity of so vast a haunt of human beings with their manifold interests and occupations.[1] Nor was the proximity of so great a city indicated long before arriving at its gates by suburbs stretching far into the surrounding plain. The rhetorical flights of certain writers who would assure us of the contrary, and persuade us that Rome sent forth her feelers as far as Aricia and Tibur, and that many cities were attached to it by continuous lines of building, are plainly refuted by the fact that groves, villages, and separate houses are repeatedly mentioned as existing within three or four miles of the capital.[2]

Tombs by the roadside.

The solemn feeling with which, under such circumstances, a great city would naturally be approached, was redoubled by the wayside spectacle, peculiarly Roman, of the memorials of the dead. The sepulchres of twenty generations lined the high roads for several miles beyond the gates; and many of these were edifices of considerable size and architectural pretension: for it was the nobles only whose houses were thus distinguished, and each

Propertius, i. 14.:

"Et modo tam celeres mireris currere lintres,
Et modo tam tardas funibus ire rates:"

and Martial, iv. 64.:

"Quem nec rumpere nauticum celeusma,
Nec clamor valet helciariorum."

[1] Many indications might be alleged of the frequency of night travelling. The Allobroges were circumvented on their leaving Rome in the evening. Catilina made his exit from the city at night; so did Curio and Antonius. Comp. Juvenal, x. 19.:

"Pauca licet portes argenti vascula puri
Nocte iter ingressus."

[2] See the passages of the ancients, and ill considered inferences of the moderns, in De la Malle, *Econ. Pol.* i. 375.

patrician family pointed with pride to its own mausoleum, in which it gathered the ashes of its members, and often of its slaves and freedmen, beneath a common roof. Flanked by such rows of historic marble, and crossed by the gaunt shadows of funereal cypresses, the Appian, the queen, as it was proudly termed, of all Ways, as the oldest, the longest, and the most frequented, approached the city from the south.[1] At five miles' distance from the walls it traversed the famous plain where the Horatii decided the fate of the young republic, and where the monuments of the Roman and Sabine champions indicated the spots on which each had fallen.[2] Nearly at the first milestone, as measured from the Servian gates, it passed under the arch of Drusus, and thence descended a gentle slope into the hollow of the Aqua Crabra.[3] The monuments of the dead now lay closer together. Here were the sepulchres of the Scipios, the Furii, the Manilii, the Servilii, Calatini and Marcelli; of which the first four have been already discovered, the rest still await the exploration of the curious.[4] Here were laid under a common dome in cells arranged along the walls, the ashes of the slaves of Augustus and Livia.

[1] Stat. *Sylv.* ii. 2. 12.: "Appia longarum teritur Regina viarum."

[2] Liv. i. 25.; Dionys. Hal. *Antiq. Rom.* iii. 18.: The modern topographer Canina accounts for a bend in the road at this point, as meant to avoid the desecration of these sacred memorials. *Annali del Instituto*, &c., 1852, p. 268. He thinks that the actual monuments have been discovered in the most recent excavations.

[3] Fragments of the first milestone have been discovered at 512 palms (about 120 yards) beyond the Porta S. Sebastiano. Canina, *Annali*, 1851, p. 317. The arch of Drusus stands a little within that modern gate.

[4] Cic. *Tusc. Disp.* i. 5. The excavations of the last few years extend from the fourth to the ninth milestone. Besides the foundations of villas, temples, and sepulchres, many inscriptions have been brought to light, which appear, however, in almost every case to belong to the later periods of the empire. It is *possible*, from the single word "Cotta," which can now be read upon the Casal rotondo, a monument of similar character to that known by the name of Cæcilia Metella, that this was the tomb of Messala Corvinus. See Canina, in *Annali*, 1851.

Hard by the gate reposed the remains of the base Horatia, slain by a patriot brother for her devotion to a foreign lover. Beside the rivulet, on the southern slope, perhaps of the Cælian Hill, was the reputed grotto of Egeria, once rudely scooped out of the rock; but its native simplicity had long been violated by the gaudy pomp of architecture and sculpture.[1] On the descent to the Aqua Crabra, the temple of Mars crowned the eminence which fronted the gate of the city, the spot from which the procession of the knights to the Capitol on the Ides of Julius took its commencement.[2] Still nearer to the gate, on the right side of the road, were the twin temples of Honour and Virtue, vowed by the great Marcellus for his conquest of Syracuse, which he had adorned with the earliest spoils of foreign painting. From the steps of these temples the populace had greeted Cicero on his return from exile. The gate, surnamed Capena, dripped constantly with the overflowings of the Aqua Appia, and of a branch of the Marcia brought there to join it: the united stream was carried over the arch on its way to the Aventine.

Entrance to Rome.

Here we enter Rome: the road has become a street; houses, hitherto interspersed between monuments and temples, have now become dense and continuous. The avenue is still, however, broad and straight for the convenience of military processions. Soon it forks into two ways, still following the direction of the hollows between the hills: the one, turning to the right between the Palatine

[1] Juvenal. iii 18.

[2] The temple of Mars stood on an acclivity (Clivus Martis), and faced the Porta Capena: "quem prospicit ipsa Appositum tectæ porta Capena viæ." It was probably, therefore, on the descent to the Aqua Crabra, in going towards the city. That there was some interval between it and the gate appears from Livy, x. 33.: "semitam saxo quadrato a Capena Porta ad Martis struxerunt." The lowering of this hill is recorded on an inscription in Gruter: "Clivum Martis pec. publica in planitiem redegerant."

and Cælian, was conducted to the Velia, the Esquiline and the Forum, till it arrived at the golden milestone at the foot of the Capitol; the other, to the left, entered one extremity of the Circus Maximus, beneath the Palatine and Aventine, to pass out of it at the other, and reach the same termination through the Forum Boarium and the Velabrum.[1]

The seven hills of Rome have been diversely enumerated, and admit, indeed, of being multiplied to a much greater number, or, regarding them from a different point of view, of being not less considerably reduced. The Aventine is the only eminence among them wholly distinct and separated from the others. The Palatine is connected with the Esquiline by the low ridge or saddle of the Velia, and the Capitoline was in like manner attached at its northern extremity to the Quirinal, till severed from it by an artificial cutting a century after Augustus. The Quirinal, the Viminal, the Esquiline, and the Cælian, to which may be added the extra-mural eminence of the Pincian, are in fact merely tongues or spurs of hill projecting inwards from a common base, the broad table-land which slopes on the other side almost imperceptibly into the Campagna. On approaching Rome from the north the eye was at once arrested by the abrupt escarpment of the Capitoline, which sufficed to exclude from it all view of the city; but from the south or east it was carried gently upwards along the rising slopes, and allowed

The seven hills of Rome.

[1] There was unquestionably a communication through the circus longitudinally for the triumphal processions; but it is not likely that this was kept open for ordinary traffic. The usual thoroughfare must have run alongside the outer wall of the circus, and was perhaps conducted under the arcades which supported the upper seats of that edifice. The upper part of the circus was connected with the buildings on the Palatine on one side, and probably with those on the Aventine on the other, the whole width of the valley between being thus occupied by its extensive structures. The Aqua Crabra, we must suppose, was carried in a tunnel beneath it.

to overleap the depressions which lay beyond them, of the Suburra, the Circus, the Velabrum and the Forum, in which the densest buildings of the city nestled, till it lighted on the heights of the Capitoline and the summits of the Etruscan mountains in the distance.

The Palatine.

The Palatine Hill, which was closely embraced by the double arms of the Appian Way,—the site of the city of Romulus, the cradle of imperial Rome,—was an elevation of about 130 feet above the level of the sea.[1] With some assistance from art it was made to slope abruptly on every side, though at its junction with the Velia its height was not more than half that which has been ascribed to the mass in general. It formed a trapezium of solid rock, two sides of which were about 300 yards in length, and the others about 400: the area of its summit, to compare it with a familiar object, was nearly equal to the space between Pall Mall and Piccadilly, in London. Along the brow of the escarpment ran; we must suppose, the original walls; but no fragments of them remain, nor have our authorities preserved any notice of their exact position. The site of two of the gates may be pointed out perhaps at the base of the cliffs; but it is possible that these mark the apertures, not in the defences themselves, but in the sacred enclosure of the pomœrium beyond them.[2] This fanciful limitation had been

[1] This and subsequent measurements, taken from M. Bunsen's work on Rome, refer of course to the present elevation. Some allowance must be made for the degradation of the summits. At the same time the hollows have been filled up to the depth, in some places, of fifteen or twenty feet. It must be remembered that the bed and water-line of the Tiber have also risen, though probably in a less degree. The crown of the arch of the Cloaca at its embouchure stands now very little above the mean level of the river. We are told that in ancient times the tunnel could be navigated by boats, and admitted a waggon loaded with hay: but this perhaps supposes the water at its lowest.

[2] The Porta Mugionis, the present access to the Palatine from the north near the arch of Titus, and the Porta Romana on the west, near

traced round the foot of the hill, after the Etruscan fashion, with a plough drawn by a bull and a heifer, the furrow being carefully made to fall inwards, and the heifer yoked on the near side, to signify that strength and courage are required without, obedience and fertility within the city.[1] The broad ways which encircled the Palatine skirted the borders of the pomœrium, and formed the route of the triumphal march, and of the religious and political processions.[2]

The Palatine occupied by temples and patrician residences.

The locality thus doubly inclosed was reserved for the temples of the gods and the residence of the ruling race, the class of patricians, or burghers, as Niebuhr has taught us to entitle them, which predominated over the dependent commons, and only suffered them to crouch for security under the shadow of the walls of Romulus. The Palatine was never occupied by the plebs. In the last age of the republic, long after the removal of this partition, or of the civil distinctions between the great classes of the state, here was still the chosen site of the mansions of the highest nobility. Here stood the famous dwelling of the

the church of S. Teodoro. There was probably a third gate at the south-eastern corner of the hill, where Severus afterwards built his Septizonium, to make the approach to the city from Africa, *i.e.* by the Appian Way, more imposing.

[1] Varro, *L. L.* v. 32.; Plut *Rom.* 11. From Tac. *Ann.* xii. 26., it appears that this Etruscan fashion referred to the pomœrium, not to the walls.

[2] The line of the Triumphal Way has been referred to in another place (ch. xix.). Becker has described it more closely. It seems to have run from the Porta Carmentalis (I omit the difficult question about the Porta Triumphalis), along the Vicus Jugarius, up one side of the Velabrum, and down the other again by the Via Nova, thence through the circus, &c. In this way it made a complete circuit of the original city on the Palatine, and had doubtless a religious significance. Compare also the lustral procession round the pomœria, in Lucan, i. 592.:

> "Tum jubet et totam pavidis a civibus Urbem
> Ambiri, et festo purgantes mœnia lustro
> Longa per extremos pomœria cingere fines
> Pontifices, sacri quibus est permissa potestas. . . ."

tribune Drusus, whose architect proposed so to fence it with walls and curtains that its owner should be secluded from the observation of the citizens below. The tribune's answer, *Rather build it so that all my countrymen may see me*, implied not only that he would be visible by all, but accessible to all also. The site of this house cannot be fixed with certainty; but it seems probable from this anecdote, that it overlooked the Forum, and stood therefore on the north side of the hill, not far from the Porta Mugionis. It became the property of Crassus, and was bought of him by Cicero; it was razed, as we have seen, by Clodius, but the vacant space was restored to its recent possessor, after whose death we hear of its passing into the hands of a noble named Censorinus. The house of Æmilius Scaurus was another patrician mansion in this locality. There seems reason to believe that it stood at the north-eastern angle of the hill, overlooking the valley since occupied by the Colosseum and the arch of Constantine.[1] This mansion also passed through various hands in the course of two or three generations: it was famous for the size and splendour of its columns, of the costly marble afterwards distinguished by the name of Lucullus.[2] Contiguous to the dwelling of Cicero was that of his enemy Clodius: the price the tribune had given for it, says Pliny, agreed with the madness of a king rather than the dignity of a Roman senator.[3] The Regia, the official residence of Cæsar as chief pontiff, which lay at the foot of the hill, abut-

[1] See Dezobry, *Rome sous Auguste*, i. 156. The topographical part of this generally valuable book is founded on some inveterate errors, and can only occasionally be made serviceable.

[2] Pliny, *Hist. Nat.* xxxvi. 2. These columns, four in number, were thirty-eight feet in height, and adorned the atrium of the house. They were the largest of the whole number of three hundred and sixty which Scaurus had conveyed, in his ædileship, to Rome (A.U. 696) for the decoration of a temporary theatre. They were afterwards used in the theatre of Marcellus. Ascon. *in Orat. pro Scaur.*

[3] Plin. *H. N* xxxvi. 24. 2.

ting on the forum, may have thus been placed immediately below it. We may amuse ourselves with imagining the flight of steps and the wicket in the garden wall, which admitted Pompeia's gallant to the mysteries of the Bona Dea. Agrippa, and after him Messala, occupied the house which had belonged to Antonius on the Palatine; and Domitius Calvinus, who triumphed over Spain in 715, devoted a large portion of his spoils to the construction of a mansion in this quarter also.[1] But a spot of more interest than these in the imperial annals was that which bore the residence of Augustus himself. From the modest house in which he first saw the light, the dwelling of his father Octavius, which was also on the Palatine, he removed at a later period to the mansion of Hortensius, on the same hill, and there he continued to abide, though lodged far beneath the dignity of his position, in the height of his power, till it was destroyed by fire in 748.[2] The citizens insisted on contributing to its restoration on a grander scale; and their subscriptions must have been universal if, as we read, the emperor refused to accept more than a single denarius from each. The residence of the chief of the state began already to be known from its situation as the Palatium or palace. Augustus, in his care not to press on the limits of popular favour, pretended to regard the dwelling thus erected for him as the property of the public, and relinquished a large portion of it for the recreation of the citizens.[3] It was probably connected with the Regia, and its remains are accordingly to be looked for in the north-western angle of the hill,

The palace of Augustus.

[1] Dion, xlviii. 42., liii. 27.

[2] For the emperor's changes of residence see Suetonius, *Oct.* 5. 51, 72.; and Dion, liii. 16., lv. 12. The house of Octavius was probably on the Germalus, a portion of the Palatine Hill, and the Scalæ Annulariæ descended from it to the Velabrum.

[3] Dion, lv. 12.: *τὴν οἰκίαν οἰκοδομήσας ἐδημοσιώσε πᾶσαν . . ἵν' ἐν τοῖς ἰδίοις ἅμα καὶ ἐν τοῖς κοινοῖς οἰκοίη.*

where indeed some foundations have been discovered which may have really appertained to it. Tiberius also built a mansion by the side of the Augustan, with which he eventually connected it, and thus embraced within the precincts of the imperial residence a large part of the western side of the Palatine. We shall see hereafter how later emperors extended these limits, and connected dome with dome, and at last hill with hill, by arcades, bridges, and substructions of enormous dimensions.

Temples on the Palatine.

The Palatine was ascended in more than one direction by flights of steps, and if there was any road for wheel-carriages to its summit, it was used perhaps only for the convenience of religious solemnities. The houses of the nobility here, as in other parts of Rome, were isolated structures, placed at the caprice of their owners, surrounded by gardens, and never regularly disposed in streets, an arrangement which was confined to the lower level and inferior habitations of the city. They were interspersed with temples, colonnades and sacred groves. On the summit of the Palatine stood, among many others, the temples of Cybele and Juno Sospita, of Luna, of Febris, of Faith and Fortune, of Mars and Vesta: but none of these was so illustrious as that of Apollo, the emperor's patron, which was dignified by a spacious area inclosed by porticos, where the trophies of all nations were suspended. To this temple was also attached the celebrated library, in two compartments, devoted respectively to the writings of the Greeks and the Romans.[1] On the slopes of the hill, or immediately at its foot, were temples of Victory and of Jupiter Stator, bordering upon the Forum: the shrine of Pan, called also the Lupercal, stood at the entrance to the Velabrum.[2] On the

[1] Suet. *Oct.* 29.; Vell. iii. 81.; Dion, liii. 1.

[2] Virgil, *Æn.* viii. extr.:

"Ipse sedens niveo candentis limine Phœbi,
Dona recognoscit populorum, aptatque superbis
Postibus."

crest which overlooked the circus was a venerable monument, which pretended to be the regia of Romulus and Numa, and also a square mass of masonry, to which was given the name of Roma Quadrata, supposed to have some mysterious connexion with the fortunes of the city, beneath which certain precious amulets were deposited.[1]

The Quirinal, Viminal, and Esquiline.

While the Romans were fortifying themselves on the Palatine, the neighbouring summits did not remain unoccupied. The Quirinal, the Viminal, and the Esquiline, the three principal spurs of the great northern ridge, were separated from the Palatine by a swampy jungle, and their crests were crowned with the strongholds of a rival tribe. The Quirinal at least was in the hands of a Sabine colony; and we may conjecture that the settlers on the other eminences were closely connected with these, from the tradition of the earthen mound which seems to have closed, in remote antiquity, the mouth of the valley between them.[2] The Romans and the Sabines contended for the possession of the Capitoline. This hill, the smallest of the seven, was flung across the hollow which descended westward from the Velia, and while it

The Capitoline.

We may remember how throughout this book the poet revels in allusions to the objects on the Palatine, and surrounds the residence of his patron with a halo of historic associations.

[1] Festus, in v. Quadrata, p. 258.: "Quadrata Roma in Palatio ante templum Apollinis (it lay towards the circus) dicitur, ubi reposita sunt quæ solent boni ominis gratia in urbe condenda adhiberi (they were bones of animals and implements) quia saxo munitus est initio in speciem quadratam."

[2] The early Sabine occupation of the Quirinal is attested by the presence here of many shrines of Sabine divinities, such as those of Sancus, of Quirinus, and perhaps of Flora. The college of the Salii was at the Colline Gate. Here was a house of Numa, the Sabine king, and, at a later period, the temples of the Sabine emperors of the Flavian house. The antiquity of its occupation is shown by the Capitolium Vetus, the rival Capitol, in which, as in the other, was a temple common to Jupiter, Juno, and Minerva. Varro, *de Ling. Lat.* v. 32. It stood probably on the crest of the hill, facing the Forum.

touched the Quirinal of the Sabines at one end, was separated from the Palatine of the Romans by the valley of the Velabrum at the other. It rose in two summits: the Sabines seized the northern; the Romans established themselves on the southern.[1] A small rectangular space lay depressed between them, which for convenience we may call the Intermontium, and this the Romans seem to have been the first to make their own. The sacred grove, or asylum, in which they offered a retreat for fugitives, was meant, we may suppose, to encourage desertion from the enemy. The disputes between the two powers ended in their union and coalition; the morasses of the valley were drained for their comitium or place of meeting, and their common forum or thoroughfare; while the fortress of the united confederacy was founded on the northern summit of the hill they shared between them, and the great temple of their common patron Jupiter on the opposite extremity: the one was called specifically the Arx or Citadel; the other bore the august name of Capitolium.[2] The former contained only one important civil edifice, the temple of Juno Moneta, or the Roman mint; the latter was the centre of the religious system of the city, the spot where the holiest mysteries of her faith were solemnised by the chief of her priesthood, the consul or the dictator; to which the imperator led his conquering legions preceded by the spoils and captives of his triumph, and where he returned his thanks for victory with appointed sacrifices. This was that rock eternal and immovable, to which the empire of the world was promised, and which the race of Julius and Æneas should inherit

The Arx and Capitolium.

[1] The northern summit, now known as the Araceli, is the higher of the two, and rises 151 feet above the sea.

[2] The respective sites of the Arx and Capitolium are still a matter of controversy on which it would hardly be proper to enter in this work. I shall have further occasion to notice the question.

for ever and ever. The temple of Jupiter Capitolinus was divided into three cells, occupied by statues of the king of gods and Juno and Minerva, his assessors; the ancient divinities Terminus and Juventas, who refused to quit their wonted stations on the foundation of the Capitol, were accommodated with places within the sacred walls. Here the images of the gods, on occasions of peculiar solemnity, after being paraded through the city on litters, were reclined on costly cushions, and invited to a gorgeous banquet. The Jupiter of the Capitol was called also the Tarpeian, from the name of the cliff which fronted the Palatine, a precipice eighty feet in height; and this was the direction in which his temple looked.[1] On the same summit was a second shrine of Jupiter, under the title of Feretrius, or the spoil-bearer, and another was erected here also to the same divinity by Augustus, under the name of the Thunderer.[2] The Capitoline was climbed perhaps by three paths; of which two, the Clivus Asyli and the Clivus Capitolinus, sprang from the Forum and ascended to the Intermontium, on the right and left hand respectively. The first of these, the existence of which is matter of question, was probably a mere flight of steps; the other was practicable for carriages, and for this purpose was made to climb the acclivity with a zigzag. The triumphal chariot rolled up this path, and was admitted within the fortress through the gate Pandana, midway on the ascent. There was a third access by the flight of the Hundred Stairs from the southern extremity, where the hill approached within three hundred yards

The Temple of Jupiter, Tarpeius or Capitolinus.

Of Jupiter Feretrius, and Tonans.

Clivus Asyli and Clivus Capitolinus.

[1] Becker has fully shown that Mons Tarpeius and Mons Capitolinus are convertible terms; the first, at least, being only the earlier, the second the later designation: hence the Jupiter of the Capitol is called sometimes by the one name, sometimes by the other.

[2] Dion, liv. 4.

of the river. The chief approach in modern times, that from the west, or the Campus Martius, was then a sheer declivity, and the spot most jealously guarded along the whole crest of the hill.

The Cœlian Hill.

The Capitoline was the great bulwark of Rome against the Etruscans descending the Tiber from the north. But a colony of that people settled at a very early period on an eminence in the opposite quarter, which derived its name of Cœlius from their leader Cæles Vibenna. These strangers, it is said, were transplanted, under a convention with the holders of the Palatine, to the valley between that hill and the Capitoline, the memory of which event was preserved in the appellation of the Tuscan Street, which led through the Velabrum from the Forum to the river side. The Cœlius then fell into the possession of the Romans, who repeopled it with a colony of Latins transplanted from Alba Longa, their recent conquest.[1] In consequence perhaps of this early destination, this hill was never a strictly patrician quarter, although many noble mansions and particularly that of Cæsar's officer, Mamurra, were to be found there; it was covered with the houses of all classes indiscriminately, and became, at least under the empire, one of the most populous regions of the city.[2]

The Aventine.

The Aventine, which from its position might well have become the most formidable rival of the Palatine, was condemned by the same caprice of fortune which had robbed it of the August Augury, on which the life of the city depended, to play an obscure and insignificant part in the early

[1] Liv. i. 30.; Strabo, v. 3. p. 234.

[2] For the palace of Mamurra, who first encrusted his walls with marble, see Pliny, *Hist. Nat.* xxxvi. 6.:—for the number of noble residences, Martial, xii. 18.: "Dum per limina te potentiorum Sudatrix toga ventilat, vagumque Major Cœlius et minor fatigant:"—for the mixture of all classes, Vell. ii. 130., describing a fire which ravaged the Cœlian Hill: "omnis ordinis hominum jactura."

history of the Romans. This hill was a holy spot reserved by the neighbouring tribes for the meetings of their confederacy, of which Rome herself was the head, and was consecrated to Diana, whose temple continued for ages to be the most conspicuous object upon it.[1] When appropriated by the Romans under Ancus, it was assigned as public domain to the use of the patricians. The ruling caste placed on it some bands of Latins as their tenants and clients, and it was thus converted into a plebeian suburb of the haughty Palatine.[2] The space which lay between the two hills, the valley of the Aqua Crabra, had been devoted by Romulus to the public games; and here, after the stream was arched over and the area levelled and strown with sand, the Great Circus, a stadium 600 yards in length, furnished seats for 150,000 spectators of the national races. Such was the extent of the city and its dependencies when Servius Tullius, according to the tradition, resolved to embrace the whole together within a common line of defences. The summits indeed of the precipitous cliffs might require no artificial fortifications, and it would seem that the Capitoline itself had no other protection at some points than the steepness of its natural escarpment; but dykes were thrown across the hollows, and the most accessible spots on the hills were strengthened with mounds of earth or masonry. The long level ridge from which, as has been described, the Esquiline, Viminal, and Quirinal spring, was fortified by a continuous ditch and rampart, which obtained the special appellation of the Servian Agger. That there was no stone wall here may be inferred not only from this title, but also

The walls of Servius.

[1] Servius compares the Latin worship of the Aventine Diana with that of the Ephesian by the Ionian confederacy. Livy considers it an acknowledgment of the supremacy of Rome by her Latin allies. i. 45.

[2] Liv. i. 33.

from the fact, already noticed, that Mæcenas extended the gardens of his palace on either side of the mound. It is hardly to be supposed that he would have ventured to level a wall of masonry, but it was easy to convert an earthen terrace, by sloping and planting, into a pleasant promenade for the public.[1] The Servian lines continued, however, still to form the nominal boundary of the city, though the idea of maintaining them for defence had long been abandoned as superfluous. While the temples of the gods and the palaces of the wealthy were planted, as we have seen, for the most part, on the airy summits of the hills, the dwellings of the lower classes were clustered together in the narrow valleys between them. The roads were measured from the gates of the Servian inclosure; and here began the straight lines of their interminable avenues. Within the walls the streets were laid out with no such regularity, or rather they may be said to have grown up as caprice or accident dictated, so that the names of few of these confined and tortuous alleys have been preserved, and of these few we can seldom ascertain the direction. The Forum alone of all the public places of the city was designed with any approach to regularity. Its open space, nearly rectangular in form, was inclosed by

The valleys of Rome.

The Forum Romanum.

[1] Hor. *Sat.* i. 8. 14., referred to in a former chapter. This account of the real character of the Servian walls is confirmed by the almost total absence of any actual traces of them, though the topographers have pitched here and there upon substructions in the face of the cliffs as remains of this primitive fortification. Already in the time of Augustus the Greek antiquarian could find few portions of them, on account of the private dwellings which had encroached upon them: δυσεύρετον διὰ τὰς περιλαμβανούσας αὐτὸ πολλαχόθεν οἰκήσεις, ἴχνη δέ τινα φύλαττον κατὰ πόλλους τόπους τῆς ἀρχαίας κατασκεύης. Dion. Hal. *Ant. Rom.* iv. 13. Strabo certainly was no believer in a continuous Servian wall. After noticing the agger as a defence or a special point, he accounts for its exceptional character, διότι Ῥωμαίοις προσῆκεν οὐκ ἀπὸ τῶν ἐρυμάτων, ἀλλὰ ἀπὸ τῶν ὅπλων καὶ τῆς οἰκείας ἀρετῆς ἔχειν τὴν ἀσφάλειαν καὶ τὴν ἄλλην εὐπορίαν, προβλήματα νομίζοντες οὐ τὰ τείχη τοῖς ἀνδράσιν, ἀλλὰ τοὺς ἄνδρας τοῖς τείχεσι (v. 3. p. 234.).

paved roads which skirted its border, and were specially intended for processions. These roads were lined, on the edge where they approached the bases of the hills, by rows of temples and public edifices; and the limits of the most famous area in the world may be distinctly traced to this day by the remains of these historic monuments. Strange it is to observe within how small a space the affairs of the greatest of empires were transacted. From the slope of the Velia to the foot of the Capitoline its length does not exceed three hundred yards, and its breadth, which increases as it advances westward, varies from about fifty to one hundred. The temple of Julius on the one height fronted that of Jupiter on the other. On the right stood the ancient temple of the Penates and that of the twin heroes, Romulus and Remus, with the spacious hall of Paulus Æmilius; on the left the shrine of Vesta, in which the sacred flame was ever burning, with the mansion of the chief pontiff annexed, the temple of the twin gods Castor and Pollux, and the basilica of Julius Cæsar. In the time of the republic the sides of the Forum had been lined with shops, having dwellings over them; but these had been latterly displaced by sacred and civil buildings, such as have been noticed. The line of the Sacra Via, which descended from the Velia, under the arch of Fabius, and skirted the Forum on the right, was bordered on one side by these public edifices, on the other by a range of statues on pedestals, or columns, forming an august approach to the Capitol, which it mounted by an oblique and gradual ascent before the temples of Concord and of Saturn. To this avenue, similarly adorned and directed towards the same point, corresponded the Nova Via on the left. But the whole space thus described generally as the Forum Romanum was more properly divided into two portions, of which one slightly elevated above the other was strictly denominated the Comitium, and was ori-

ginally the place of honour assigned to the Populus as distinguished from the Plebs. The Rostrum, or tribunal for public speaking, which stood in the centre of the open space, was turned at first towards the Comitium, and away from the Forum: the harangues of the orators were addressed to the curies, and not to the centuries. The bold change by which the Rostrum was directed towards the opposite quarter was the manœuvre of Livius Drusus, the popular tribune: but at that time the distinction of plebs and populus had almost ceased to exist; the Comitium soon lost its political significance; and while the senators transacted their affairs under the cover of halls and temples, the mighty multitude of the Roman people occupied without dispute the whole vacant space between the Sacred and the New street, and crowded without order or distinction of places around the occupant of the political pulpit. The meetings of the senate were held most frequently in the Curia Hostilia, which stood beneath the north-west angle of the Palatine, and was flanked, a little in advance, by a small building called the Græcostasis, in which foreign envoys awaited the summons of the imperial assembly. But this curia had been consumed in the Clodian conflagration, and other halls or temples were at different times adopted at the caprice of the consuls or the emperor. Year after year the Roman Forum received fresh accessions of splendour and convenience. The fire just referred to cleared a space for nobler constructions, and first suggested the idea of more important changes and additions. With the surrender of political privileges grew the taste for ostentatious display in the enlargement and decoration of the site which had once been consecrated to their exercise. The colonnades by which the place became surrounded, connecting hall with hall, and temple with temple, were in the morning the thoroughfare of men of business,

Enlargement and decoration of the Forum Romanum.

but at a later hour were almost abandoned to the seekers of pleasure and dissipation. The area of the ancient Forum was found, however, too narrow either for the one use or the other. Various attempts had been made to gain additional space; and it was with this view perhaps that the rows of shops or stalls which formerly inclosed it, had been recently demolished. It was not so easy to remove the temples and other consecrated objects, which continued to present impassable barriers to extension at almost every point. Behind them, however, on the right, there was still a space nearly level, reaching to the foot of the Esquiline and Quirinal; and here on the site of the ancient grove of Argiletum, and in the jaws of the Suburra, the population of Rome was most densely crowded together. Overlooked by the temples and patrician mansions of the Carinæ and other surrounding heights, the Argiletum and the Suburra were the abodes of artificers of all kinds, the workers in metals and in leather, the clothiers and perfume-sellers. This, moreover, was the quarter of the booksellers, and the publicans, of the retailers, in short, of every article of luxury and necessity. Here was concentrated much of the vicious dissipation of a large capital; and here the young gentlemen of Rome, just emerged from dependence on their parents and tutors, might lounge with friends or flatterers, and glance without control on every object of interest or amusement.[1] In earlier times the Suburra had been the residence of many noble families, and here Julius Cæsar had himself been born; but as they advanced to the highest pinnacles of greatness, they had migrated to the more conspicuous quarters of the Palatine or the Esquiline,

The Argiletum and Suburra.

[1] "Quales in media sedent Suburra." Martial, vi. 66. Compare Persius, *Sat.* v. 32.:

"Cum blandi comites, totaque impune Suburra
Permissit sparsisse oculos jam candidus umbo."

and fashion had now generally deserted the lower parts of the city. From the entrance of the Suburra branched out the long streets which penetrated the hollows between the Quirinal, Viminal, and Esquiline, to the gates pierced in the mound of Servius. It was in this direction that Cæsar effected the first extension of the Forum, by converting the site of certain streets into an open space which he surrounded with arcades, and in the centre of which he erected his temple of Venus. By the side of the Julian Forum, or perhaps in its rear, Augustus constructed a still ampler inclosure, which he adorned with the temple of Mars the Avenger. Succeeding emperors, hereafter to be specified, continued to work out the same idea, till the Argiletum, on the one hand, and the saddle of the Capitoline and Quirinal, excavated for the purpose, on the other, were both occupied by these constructions, the dwellings of the populace being swept away before them; and a space running nearly parallel to the length of the Roman Forum, and exceeding it in size, was thus devoted to public use, extending from the pillar of Trajan to the basilica of Constantine.[1]

The Forums of the Cæsars.

Next to the quarter of the Suburra, that of the Velabrum, on the opposite side of the Forum, was the most crowded portion of the city. The hollow which descended from the

The Velabrum.

[1] The reader will understand that these are the conclusions at which I have arrived, chiefly under the guidance of Becker's Handbook, upon a subject on which the views of various schools of Roman topographers have been widely divergent. It would be superfluous to specify the ancient authorities. The general arrangement of the Roman Forum by Bunsen and Becker, and the German school as opposed to the Italian, ought to be considered as settled by the recent excavations, which have revealed beyond dispute the sites of the Æmilian and Julian basilicas. At the same time, it cannot be denied that the Italians, headed by Canina, have not yet surrendered their theory, that the Forum extended longitudinally towards the Tiber, and not towards the Velia, and maintain that the Julian basilica was an encroachment upon the ancient area.

Velia, after meeting that of the Suburra, turned obliquely towards the Tiber; and the Nova Via, which skirted the base of the Palatine, followed its flexure from the temple of Castor and Pollux, and formed the boundary of the Velabrum on one side, as it had before limited the Forum. But the Velabrum, the space between the Palatine and the Capitoline, was wide enough to admit of two other streets running parallel to the Nova, the Vicus Tuscus and the Vicus Jugarius. These avenues, descending from the Forum Romanum, opened upon the Forum Boarium, the spot perhaps where the cattle destined for the consumption of Rome were landed from the barks on the Tiber: but they were also the great outlets of the multitudes which hurried from the heart of the city to the shows of the circus, and the recreations of the Campus Martius. The Vicus Tuscus, the middle street of the three, was perhaps the most crowded thoroughfare of all, the Cheapside of Rome. The public buildings in this quarter were comparatively few and insignificant, and we may believe that the whole space of the Velabrum was densely packed with the cabins of the industrious classes.

The Forum Boarium.

The streets which traversed the Velabrum led direct to the bank of the Tiber, and to the oldest of the bridges of Rome, the Sublicius, or bridge of piles, which connected the city with the Transtiberine quarter, called also Janiculan, from the slope on which it stood. This district, rising in terraces from the river, enjoyed a noble view of the seven hills on the opposite bank, and was also celebrated for its salubrity, which circumstances combined to attract to it the wealthier citizens under the later republic and the empire, who spread themselves along the crest of the adjoining eminences, and gradually occupied the whole ridge of the Vatican. The lower part continued to be the resort of the poorer

The Transtiberine quarter.

classes. But the importance of this region may be inferred from the aqueducts which were constructed to supply it, the numerous bridges which connected it with other quarters, the venerableness of its shrines, especially that of the goddess Fortuna, and the station there of one cohort of the city police, or Vigiles. The island in the Tiber, fashioned at either end into some rude resemblance to a ship, was also included in the Transtiberine, and was densely crowded with habitations. The gardens of Cæsar on the right bank of the river have been already described. Augustus excavated a naumachia, or basin for the exhibition of naval engagements, by their side. He surrounded it with groves and walks, to which he gave the names of his grandsons Caius and Lucius, and supplied it with water, not, as might have been expected, from the adjacent river, but by means of an aqueduct from the lake Alsietinus, or Bracciano, in Etruria.

The Campus Martius.

We have still to notice the two regions beyond the Servian walls, in the broad plain to the north of the city, which may be designated by the comprehensive name of the Campus Martius, though that appellation, as we shall presently see, was more strictly confined to a certain portion only. From the earliest period the grassy meadows which here skirted the Tiber had been a resort for military exercises, and the recreations of leaping, running, and bathing. From the Porta Ratumena and the Carmentalis, on either side of the Capitoline, the citizens poured after the business of the day, to indulge in these sports, a custom which survived, through the whole period of the republic, late into the times of the emperors. Gradually, however, the space between the walls and the reach of the river was encroached upon by buildings of various kinds; and Cæsar contemplated, as we have seen, its extension, by giving a wider sweep to the Tiber. Here stood some of the principal temples of the gods, and here, from an

early period, were the septa, or booths, at which the centuries polled. The elections were originally a military institution, and on this account the citizens were summoned outside the walls to solemnize them.[1] The regulation that no imperator might enter the city, led to the practice of convening the senate also in the Campus Martius. Here too was the gate from which the victor, returned from distant frontiers, commenced his triumphal procession to the Capitol. Here was the gorgeous theatre of Pompeius, with its groves and porticos, and halls for business or amusement. Here stood the Flaminian circus, second only in size to the great circus beneath the Palatine; and here were the theatre of Marcellus and the portico of Octavia, the contributions of Augustus himself to the attractions of this splendid region. Here also, further from the city and precisely in the centre of the plain, still stands the magnificent Pantheon of Agrippa, which constituted a portion only of his extensive constructions in this quarter. Beyond it rose the amphitheatre of Taurus, and adjacent to the banks of the river the conspicuous mausoleum of the Cæsarean family. Up to this point the area was perhaps almost covered with edifices, but beyond it there was still a tract of open meadow, preserved for the martial sports of the Roman people, extending to the modern Ripetta and the Porta del Popolo. The whole of this district north of the Capitoline is now thronged with houses, and comprehends the chief part of modern Rome: the remains of some of the most interesting buildings of the ancient city lie buried beneath the masses of mediæval construction; and no portion of it has been of necessity so imperfectly explored, or presents so many

[1] The division of the Roman people into classes and centuries had a military object, and the word classis had originally the meaning of exercitus. Gell. xv. 27., quoting an ancient writer: "Centuriata comitia intra pomœrium fieri nefas esse, quia exercitum extra urbem imperari oporteat, intra urbem jus non sit."

insoluble problems to the topographer. It was divided into two unequal portions by the straight line of the Flaminian Way, which issued from the city at the northern angle of the Capitoline. The first portion of this road was known perhaps by the title of the Via Lata, which gave its name to the region on the right, extending beyond the level of the plain over the slope of the Pincian hill. In the course of time this road was bordered with houses, and the Corso of the modern city runs at least for some distance on its track.[1] The Pincian itself was occupied by villas shrouded in extensive parks or gardens, such as those of Lucullus and Sallust, from whence it derived the name of Collis Hortulorum. From its flank descended the arches of the aqueduct called Aqua Virgo, one of the most stupendous works of Agrippa, by which water was conveyed to the septa in the Campus Martius.[2] The Campus Agrippæ, the site of which is not determined, was a portion of the plain which the same great benefactor laid out in gardens and porticos for the recreation of the citizens, and the convenience of the bathers. It contained the thermæ which he constructed for the public; and two of its colonnades, styled the Europa and the Neptune, were celebrated for the elegance of their fresco paintings.[3] Augustus peopled the Campus with a host of statues taken chiefly from the Capitol, where they had accumulated, as the spoils of war or the votive offerings of

The Pincian hill.

[1] Martial (x. 6.) describes the Via Flaminia as running through the plain, with trees and detached houses by its sides:

"Quando erit illa dies, qua campus et arbor et omnis
Lucebit Latia cuita fenestra nuru?
Quando moræ dulces, longusque a Cæsare pulvis,
Totaque Flaminia Roma videnda via?"

[2] Frontin. *de Aquæduct.* 22.

[3] See the allusions in Martial, ii. 14., vii. 32., iii. 20. It has been imagined that the Pantheon was originally constructed for a central hall, some think for a swimming bath, to the thermæ of Agrippa. See Bunsen's *Rom.* iii. 3. 123. 341.

conquerors, to an inconvenient extent. At a later period the Forum and other public places were deliberately thinned of their overgrowths of sculpture, which amounted, it may be supposed, to many thousands of specimens, to enrich the halls, the baths, and the colonnades of the Palaces of the People.[1]

The population of Rome chiefly clustered in the lower parts of the city.

It would appear from this review that the densely populated parts of Rome covered but a small part of its whole area, for the summits of the hills were generally occupied by temples and aristocratic mansions, and large spaces even in the intervening hollows were devoted to places of public resort. The vici, or streets of Rome, as far as their names and directions are known to us, were confined to the valleys. The houses on the hills were generally detached mansions, surrounded in many cases by gardens. It must be allowed, however, that the clients of the nobles often clustered their obscure tenements against the outer walls of their patrons' palaces. But in the districts where the masses of the population were collected, such as the Suburra and Velabrum, every available inch of ground was seized for building, and the want of space was compensated by elevation. Perched upon the precipitous ledges of the hills, the houses rose to an enormous height in front, while in the rear their elevation might often be far more moderate. Rome, says Cicero, rhetorically, is suspended in the air; Rome, avers the more guarded Vitruvius, is built vertically; Tacitus speaks of houses rising from the plain to the level of the Capitoline summit.[2]

[1] Suet. *Calig.* 34.; Dion, lx. 6. The Campus Martius is described by Strabo with more vivacity than is usual with him (v. 3. p. 236.). I have avoided the debateable parts of his description, over which a furious battle *still* rages. Preller, however, the last combatant who has entered the field, especially against Becker, seems to me captious and unreasonable.

[2] Cic. *Leg. Agr.* ii. 35. "Romam in montibus positam et convallibus, cœnaculis sublatam atque suspensam." He compares it dis-

Augustus was the first to impose a limit by law to their daring ascent, and he was satisfied with fixing the greatest height at the liberal allowance of seventy feet. At the same time for no other purpose, as far as we can divine, than to economize space, their exterior walls were forbidden, we are told, to exceed a foot and a half in thickness, the minimum, perhaps, which was calculated to bear the weight of the superincumbent mass.[1] The streets, following the tracks of the cattle and herdsmen of primitive antiquity to their pastures and watering-places, were narrow and winding; and this may account for the fact that so few of them were important enough to transmit their names to history.[2] It was not till the gates had been passed that the direction of the roads began to be marked out deliberately; and except the avenues which were designed for sacred processions, or the course of which was shaped by the narrow gorges through which they ran, few perhaps preserved for many yards together the irksome uniformity of a right line.[3] Narrow as these alleys were, and little

advantageously with the broad open spaces of the Greek city of Capua. Vitruvius says: "Roma in altum propter civium frequentiam ædificata." Tacitus, *Hist.* iii. 71.: "Ædificia quæ in altum edita Capitolii solum æquabant." Aristides, in his *Encomium Romæ*, compares the stories of Rome with the strata of the earth's crust, and pretends that, if they were all laid out on one level, they would occupy the whole area of Italy from sea to sea.

[1] Vitruvius, ii. 8. Comp. Juvenal, iii. 193.: "Nos urbem colimus tenui tibicine fultam."

[2] See the description of the hurried and irregular manner in which the city was rebuilt after its burning by the Gauls, in Livy, v. 55. (Comp. Diodor. xiv. 116.) The lines of the old streets were probably preserved, for the most part, as with us after the fire of London. Livy, indeed, would have us believe that every citizen built for himself, as suited his convenience, without reference to his neighbours, or to any common plan; but this cannot, I conceive, have been generally the case. The preservation, indeed, of the names of the ancient streets sufficiently attests the contrary.

[3] Strabo contrasts the style in which Rome was laid out with the elegant designs of the Greek city builders: *τῶν γὰρ Ἑλλήνων περὶ τὰς κτίσεις μάλιστα εὐτυχῆσαι δοξάντων ὅτι κάλλους ἐστοχάζοντο.* v. 3.

adapted for the passage of wheel carriages, which indeed till a late period were hardly used in Rome, they were still more confined above, by the device of projecting balconies from the upper stories. These were known by the name of Mæniana, from the tribune Mænius, who first invented them to accommodate the spectators of the processions in the streets below. It is probable, though we have no express testimony to the fact, that these balconies were afterwards improved into hanging stories, the occupants of which could sometimes shake hands with their neighbours opposite.[1]

Style of domestic architecture.

It may be believed that the roofs of the houses in Rome were adapted to a climate abounding in violent storms of rain, and rose in steep ridges, presenting sometimes a gable (a spread eagle the Greeks would have called it) to the street.[2] The want of glass, which was hardly known up to the imperial era, and but little used for dwelling windows to a late period, compelled the Romans to make the apertures of their houses few and narrow compared with those of modern architecture[3]; but the habit of living through the day almost entirely out of doors would render this deprivation of light less intolerable. In the better class of houses, however, there were windows protected by shutters of lattice work with double

[1] See Festus in voc. Mæniana: "Mænius . . . . primus ultra columnas extendit tigna, quo ampliarentur superiora." The *Digest*, l. 16. 242. speaks of mæniana and suggrundia, projecting eaves. These projections, together with the narrowness of the streets, gave a grateful shade (comp. Cic. *Acad.* ii. 22.), and on that account were considered to contribute to salubrity. Tac. *Ann.* xv. 43. Martial, i. 87.: "Vicinus meus est manuque tangi De nostris Novius potest fenestris." But this may apply to a next-door neighbour.

[2] "Fastigia, pectinata tecta:" Gr. ἀέτωμα, τρίχωρος. Upon this subject, on which our information is indistinct, see the note of Salmasius, on Spartian. *Pescenn.* 12.

[3] Plin. xxxvi. 66.: "Neronis principatu reperta vitri arte." This can only refer to its employment for windows. Comp. Senec. *Ep.* 90.: "Quædam nostra demum prodisse memoria scimus, ut specularium usum, perlucente testa, clarum transmittentium lumen."

valves.[1] The most common material for private dwellings was brick, which not only superseded the primitive wood, but was preferred for the purpose to the stone of the country, whether extracted from beneath the soil of Rome itself, or dug from the quarries of Alba, Gabii, and Tibur. Although this stone was as easily obtained, and was perhaps the cheaper material, the Romans gave a preference to brick, from its applicability to the construction of the arch, and also for the extreme hardness and durability it assumed in their hands. The old consuls of the republic truly built for eternity, when they ranged tile upon tile, and embedded them in their concrete sand and gypsum. It was a famous boast of Augustus, when he pointed to the sumptuous halls and temples with which he had eclipsed the modest merit of preceding builders, that he had found Rome of clay and had left her of marble; but after eighteen centuries the marble has mostly vanished and crumbled into dust, while huge strata of brick-work still crop out from under the soil, a Titanic formation as imperishable as the rock itself.[2]

Style of temple architecture.

The temples of ancient Rome were all, as far as we can trace them, constructed on the Grecian pattern; that is, generally in oblong masses of masonry, with long low roofs, corresponding with the apex of the pediment. Though crowned perhaps with statues on the summit, they scarcely overtopped, except from their position, the meaner buildings around them: the invention of bells, the greatest of all boons to architecture, had not yet afforded a motive or excuse for raising the many storied

[1] Hor. *Od.* i. 25. 1.: "*Junctas* quatiunt fenestras." Pers. iii. 1.: "Jam clarum mane fenestras Intrat, et angusto distendit lumine *rimas*."

[2] This saying has been referred to in an earlier chapter. Strabo remarks that the ancients, occupied with more urgent cares, paid little attention to the decoration of the city, a merit which was reserved for Pompeius, Cæsar and Augustus, with his friends and relatives.

turret, or suggested the arrowy flight of the spire or steeple. Here and there perhaps the watch-tower of some palace or fortress might break the horizon of stone; but these were too few and unimportant in character to lead the eye of the spectator upwards, or divert him from the sights of splendour or squalor nearer to his own level. Nevertheless there was a grand significance in the crests of the hills encompassing the Forum, crowned with a range almost unbroken of columned temples, the dwellings of the gods, who thus seemed to keep eternal watch over the secure recesses of the city. If neither the architecture nor religion of the Roman pointed heavenwards, or led to spiritual aspirations, not the less did they combine to impress upon him, in their harmonious development, the great idea of Paganism, the temporal protection with which the Powers of Nature, duly honoured and propitiated, encircle their favourites among men.

The dwellings of the citizens were of two general classes, the domus and the insulæ. The former of these, which we may call mansions, were the abodes of the nobility, and were constructed originally as separate buildings, inclosed within courts or gardens, and adapted, at least since the latter years of the republic, to the Greek fashion, covering a considerable surface with a single, or at most two stories. The application to the private mansion of the ornamental architecture of Greece, which had been long reserved at Rome for temples and public edifices, soon demanded the use of the rich and polished material with which Greece abounded, of their own wealth in which the Italians were perhaps hardly yet aware. When the nobles began to build their long columnar corridors, they required marble to give variety by its colour to the interminable repetition of pillar after pillar, and the vast expanse of their level pavements. Crassus, the

The domus and insulæ.

The mansions of the nobles.

orator, was said to have first introduced into his house six columns of Hymettian marble. This was about the middle of the seventh century. Soon afterwards Lepidus paved his arcades with polished slabs from the quarries of Numidia. This nobleman's palace was reputed at that time the finest domestic edifice in Rome, but thirty-five years later it was excelled by not less than a hundred rivals.[1] Nevertheless, at a still later period, the Romans continued to wonder at the inordinate luxury of the Orientals, who piled the richest marbles block upon block, while the lords of the world could only afford to use them in thin flags.[2]

The cabins of the poorer citizens.

The domus, it has been said, were generally insulated dwellings; the insulæ, or islands, on the other hand, were precisely the contrary of what their name should import, the smaller abodes of the lower classes, closely connected together in large blocks of building, and covered with a continuous roof.[3] These little dwellings were generally built over the rows of shops which lined the area of

[1] Plin. *Hist. Nat.* xxxvi. 2, 8, 24.

[2] Lucan contrasts the magnificence of Cleopatra's palace with those of Rome in language which expresses the feeling probably of his own time:

> "Nec summis crustata domus sectisque nitebat
> Marmoribus: stabatque sibi non segnis Achates,
> Purpureusque lapis; totaque effusus in aula
> Calcabatur onyx." *Pharsal.* x. 114.

[3] A law of the twelve tables required, for security against fire, that every house should stand separate; but it is impossible that this can have applied, even at that early time, to every single chamber in which a separate family was lodged. I consider the insula to have originally been a block of chambers, such as are represented in the fragment of the ancient plan of Rome still preserved on marble, which corresponds with the style of arrangement observed at Pompeii. These rows of building were often constructed round public edifices, and the clients, operative slaves, and freedmen of the noble were often thus lodged against the walls of his domus. If insula was the term originally given to the aggregate of such dwellings, it came afterwards to be applied to the component members. Thus Tacitus uses insulæ as synonymous with tabernæ, *Ann.* vi. 45., xv. 38. See De la Malle, *Econ. Pol.* i. 364.

the streets, and were entered by stairs from the outside, having no connexion with the resorts of trade and industry below them. In a height of seventy feet there were probably from seven to ten stories, and each of these stories, and often each chamber in them, might be occupied by a separate family.[1] Being used as little else than sleeping apartments, they accommodated, in the fashion of the age and country, a multitude of inmates, the amount of which, however, we are totally at a loss to estimate. The subject, indeed, of the population of Rome has exercised the ingenuity of many inquirers, but with widely differing results. As regards the accommodation the tract covered by the city may have afforded, when we have carefully measured the circuit of the walls, and estimated the area they inclosed, we are still ignorant both of the capacity of the houses, and of the amount of empty space within the inclosure. In drawing a comparison, however, from experience in our own day, we may observe that, if modern cities on the one hand are not so closely built, nor their houses so densely inhabited as was the case with ancient Rome, on the other they have no such proportion of vacant space appropriated to gardens, and courts, and public places. Setting one of these conditions, therefore, against the other, it may seem not unreasonable to form an approximate estimate of the population of Rome from the numbers domiciled on an equal area in some modern capital.

Data for calculating the population of Rome.

I. From the area of the city.

I. According to an ancient definition, the space within the walls was specifically denominated the Urbs, or City, while the term Rome was applied to the whole unbroken extent of buildings which reached to the ex-

[1] Thus a house of four stories is indicated in the account of one of Livy's portents, xxi. 65.: "foro boario bovem in tertiam contignationem sua sponte escendisse atque inde tumultu habitatorum territum sese dejecisse."

tremity of the suburbs.[1] The Roman urbs, then, was included at this period within the walls or lines of Servius; and this area had been divided by Augustus, for administrative purposes, into eleven regions, to which he had added three others outside the walls, to embrace, we may suppose, the most frequented quarters of the suburbs.[2] The area of the eleven urban regions has been found by measurement on an accurate map to equal about one-fifth of that of the modern city of Paris within the barrier.[3] The population therefore of the urbs, if calculated on the basis of that of Paris (equal 1,050,000), would not amount to more than two hundred and ten thousand; nor is it easy to adduce any direct proof that it actually exceeded this very moderate number. Bearing in mind what has been said of the character of the buildings which prevailed in different parts of this space, the number of temples and public edifices, the extent of many private residences, the space devoted to theatres, circuses, and baths (of which last

[1] Paulus in *Digest.* l. 16, 2.: "Urbis appellatio muris, Romæ autem continentibus ædificiis finitur, quod latius patet."

[2] These three were (Reg. i.) Porta Capena; (vii.) Via Lata; (ix.) Circus Flaminius. It may be conjectured that these were included within the pomœrium as extended by Augustus in the year 746 (Dion, lv. 6.). See Becker, *Rœm. Alter.* ii. 105.

[3] For this important statement I cite the words of Dureau de la Malle (i. 347.): "La superficie de Paris (*i.e.* within the barrière de l'octroi) est, d'après les mesures exactes, de 3439 hect. 68 ar. 16c.; celle de Rome, 638 hect. 72 ar. 34c. J'ai calculé la superficie d'après le grand plan de Nolli, dont l'exactitude est reconnue. Mon savant confrère M. Jomard a eu l'extrême obligéance de revoir mes calculs; je les ai fait vérifier de nouveau par un habile mathématicien. On s'est servi du périmètre déterminé par d'Anville pour la *première enceinte* de Rome, et vérifié de nouveau sur les lieux par M. Nibby et par Brocchi." He adds in a note that his calculations of the area of the city were again verified by Tournon, the learned prefect of Napoleon's department of Rome. De la Malle's calculations were made about 1824, and his statement of the population of Paris (714,000) refers to the year 1817. *Econ. Pol.* i. 369. The estimate in McCulloch's *Dict. of Geography* for 1846 is, 1,050,000. There has been a great extent of building within the barrier during that interval.

Agrippa alone established, within and without the urbs, no less than a hundred and seventy), the numerous groves and gardens which existed even within the walls, it will be allowed that the surface actually covered with the abodes of the masses can hardly have exceeded that similarly occupied in Paris, or any of our cities at the present day.[1] It has been shown, however, how closely the houses of the densest quarters were packed together; and we may also believe that the space required, man by man, at Rome was much smaller than accords with our modern habits. This arises from the outdoor mode of life practised in ancient Italy, from the number of slaves, who were huddled together without respect to health or comfort, and from the sordid notions of domestic comfort common even to the higher classes. Thus, while they allotted ample space to their halls for banquets and recreation, their sleeping rooms were of the smallest possible dimensions. The habitations indeed of mediæval Europe were far more densely crowded than our own, and such we may easily believe was the case with the ancient urbs also. Assuming, however, that from these considerations we may double the amount of its population as compared with modern Paris, we shall still be surprised, and perhaps even startled, to find that we cannot raise it above four hundred and twenty thousand.

If we now look to suburban Rome, and seek for compensation in that quarter for the slender amount of population within the walls, we shall still be disappointed. From the time indeed of the retreat of Hannibal the citizens had ceased to require the protection of military defences for their dwellings, and there was no impediment, except in the reserved space of the pomœrium, to their constructing their houses outside the ancient lines, and

Extent of the suburbs.

[1] There were, according to Pliny (*Hist. Nat.* iii. 9.), not less than 265 open places in Rome.

at as great a distance from them as they pleased. Modern Vienna, with its central urbs, surrounded by a broad vacant glacis, and again by a second belt of houses beyond it, may offer a considerable resemblance to the Rome of Augustus.[1] These outer buildings continued no doubt to increase both in extent and density, through the two following centuries, before they were finally inclosed in the second and wider circumvallation, which still marks the greatest spread of the imperial metropolis, embracing an area rather more than twice the size of the Servian city, or than two-fifths of that of Paris.[2] But in the Augustan period this outer area was only partially occupied with buildings. Augustus, when he added three Suburban regions, the Via Lata, the Circus Flaminius, and the Porta Capena, to the eleven Urban, included in them a portion only of this intermural space, and of these the Circus at least can have had very few private dwellings of any kind. It may be wrong, however, to assume that the rest of the space uncomprised in these three regions was not also encroached on by numerous habitations; for so London runs into extensive and populous suburbs, though they are excluded from the limits of its component boroughs, and known perhaps by no distinctive appellations. On the other hand, however, the great number and extent of private villas and gardens,

[1] There is no statement, I believe, of the ordinary width of the pomœrium, which probably varied very much in different quarters. I do not suppose that it was anywhere nearly equal to that of the glacis at Vienna; and indeed, in the time of Augustus, it had been greatly encroached upon. If, as Dionysius tells us, the lines of Servius could no longer be traced throughout in his days, neither certainly could the pomœrium.

[2] De la Malle (i. 347.) calculates the area of the Aurelian inclosure at 1396 hect. 9 centiar.: it seems on the map much more than double the Servian. D'Anville (cited by De la Malle) states the length of the Servian walls at 6187½ toises, or 8186 Roman passus; that of the Aurelian, at 12,345 toises. Hence this happy correction of Pliny, VIII. M.CC. for XIII. M.CC., *Hist. Nat.* iii. 9.

such as those of Mæcenas, of Pallas, of Sallust, of the Lamiæ and Laterani, of Cæsar, and many others of historical celebrity, which occupied large sites between the Servian and Aurelian walls, though some of them eventually gave way to the extension of streets and lanes, clearly indicate that at an earlier period that area was far from filled with ordinary dwellings. Nor, again, is it possible to give a high estimate to the more distant suburbs of Rome. Up to the gates of the city the Campagna yields few vestiges of ancient habitation, except here and there the foundations of isolated villas; and the roads, as we have seen, were lined, not with rows of tradesmen's lodgings, but with a succession of sepulchral monuments, which the feelings of the Romans would have shrunk from desecrating by proximity to the abodes of life.[1] It seems unreasonable, then, to estimate the extramural population at more than one-half of that within the walls, which will raise the sum total to six hundred and thirty, or, making a liberal allowance for soldiers and public slaves, who occupied the baths and temples, about seven hundred thousand.[2]

II. But any estimate formed on such grounds as these only must at best be very uncertain, and it will be well to inquire whether the arguments which may be drawn from other sources

2. The recorded number of houses.

[1] It is difficult to resist the strong expressions of Pliny, Dionysius, and others: but we must shut our ears to their reckless exaggerations; such as, Plin. iii. 5.: "Exspatiantia tecta multas addidere urbes." Dion. Hal. iv. 13.: οὐτὸ συμφέρονται τῷ ἄστει ἡ χώρα, καὶ εἰς ἄπειρον ἐκμηκυνομένης πόλεως ὑπόλειψιν τοῖς θεωμένοις παρέχεται; and the passage of Aristides, before referred to, *Encom. Rom.* vol. i. p. 324.: εἴ τις αὐτὴν ἐθελήσειε καθαρῶς ἀναστύξαι, καὶ τὰς νῦν μετεώρους πόλεις ἐπὶ γῆς ἐρείσας θεῖναι ἄλλην παρ' ἄλλην, ὅσον νῦν Ἰταλίας διάλειπον ἔστιν ἀναπληρωθῆναι, τοῦτο πᾶν ἂν μοι δοκεῖ, καὶ γενέσθαι πόλις συνεχὴς μία ἐπὶ τὸν Ἰόνιον τείνουσα.

[2] De la Malle fixes the population of the Servian urbs at 266,684, that of the Aurelian at 382,695, and of Rome, including the suburbs at their furthest extent, at 502,000. To these he adds 30,000 for strangers, and an equal number for soldiers, making a total of 562,000. i. 403.

serve to confirm or to invalidate it. There exists an ancient statistical account of Rome, in which, among other specific numerical notices, the number of the domus and insulæ respectively is given for each of the fourteen regions.[1] The date of this little work cannot perhaps be fixed very nearly, but the substance of the information it conveys may be referred to the third century of our era, after the building of the Aurelian walls, and at the period probably of the greatest extension of the city. We must bear in mind, therefore, on the one hand, that the density of habitation in the urbs was unquestionably reduced after the time of Augustus; and on the other, that the whole enlarged area was more uniformly occupied with dwellings. If these circumstances may be supposed nearly to balance one another, we may be allowed perhaps to assume that the numbers given in the *Notitia* do not far exceed the actual amount at the earlier period,—namely, 46,602 insulæ and 1,790 domus. The numbers, however, of individuals accommodated in each domus and insula respectively must still be a matter of mere conjecture, nor can we find any close analogy to guide us. The average ratio of dwellers to houses in London or Liverpool is said to be about five to one; in Paris and Vienna it is much greater; and we may, perhaps, fairly double it for the insulæ of Rome, although these were in many cases, as I have said, merely single chambers. The capacity of the domus must have been still more varied, and I confess that I am merely speaking at random in assigning to them an average of eighty occupants.[2] The result, however,

[1] See Preller's comparative edition of the *Curiosum* and *Notitia*.

[2] Brotier guesses the average at eighty-four, nor does De la Malle see reason to dissent from him. I should prefer a smaller number, because, in my view, multitudes of slaves belonging to great houses were lodged in the insulæ appended to them. Such would generally be the case with the artificers whose skill was turned to the profit of their masters. The chief argument for the great numbers of do-

of such a calculation will be found somewhat to exceed six hundred thousand for the domus and insulæ together, which does not fall greatly short of the estimate at which we have arrived from the basis previously assumed.

III. There is, however, still a third datum to be considered, which may seem at first sight to lead us to very different results, though possibly, on further examination, it may be found rather to confirm our original estimate. Augustus, as we learn from his own statement, reduced the recipients of the ordinary dole of grain to the number of two hundred thousand. When, however, he bestowed upon the plebs urbana, the populace of the city, an extraordinary donative, the numbers who partook of his bounty swelled again to three hundred and twenty thousand. The smaller of these amounts may represent, perhaps, the poorer sort of the citizens; the larger the whole population, male and free, below the senatorial and equestrian ranks.[1] This last has been assumed accordingly by many inquirers as the actual number of the commons of Rome; and this they have doubled, at one stroke of the pen, to comprehend the females, and quadrupled at another, to embrace the slaves also. When to this aggregate has been added a reasonable proportion for the noble classes, together with their wives and families, it has been thought that the enormous sum of two millions of souls is not too large for the whole amount of the inhabitants of Rome. Now, whatever we may think of the capacity of the domus and insulæ, it seems almost demonstrable, from what has been said above,

3. The number of recipients of grain.

mestic slaves is taken from the well-known case of the *family* of Pedanius, amounting to 400, who were all put to death for their master's murder. Tac. *Ann.* xiv. 45. Allowance, however, must be made for the houseless, and the slaves of the temples and public buildings.

[1] Before the time of Augustus children below the age of ten years were excluded, but he extended the gratuity to all. Suet. *Oct.* 41.

that the limits of the city can never have contained such a mass of human beings; nor, on fair examination of the data, are we driven in fact to so extravagant a conclusion. I have little doubt that the plebs urbana, as they are called, who were allowed to receive the extraordinary largess, comprehended not merely the actual residents, but as many citizens as could present themselves in person, or possibly even by proxy, from the country round. If this be so, it is evident that the specified number of three hundred and twenty thousand may far exceed that of the actual free male residents.[1] Again, with regard to the proportion of females to males, to suppose it, according to the ordinary law of nature, to be nearly equal is, I fear, in this case an unwarrantable assumption. The licence of infanticide was, we know, a principle recognised generally in the ancient polities: there can be no doubt that the crime was regularly and systematically practised by the civilized as well as the barbarous.[2] Solon enjoined, and even the gentle Plutarch approved of it; and if it is rarely noticed in books, it is perhaps only because it was too common to remark upon. Nor can there be any doubt that, under these circumstances, exposure would befall the female far more commonly than the male infants. There is, indeed, one passage of antiquity which expressly asserts the disproportion of the female to the male adults, where Dion tells us that Augustus allowed the Roman citizens below

[1] In the same manner, it may be presumed that the numbers of the census, before the time of Augustus, included not merely the residents in Rome, nor, on the other hand, the whole number of citizens within and without it, but precisely as many as could present themselves to the censors from the city and the country round.

[2] The frequency of this practice among the Romans, insinuated by Tertullian, *Apol.* 9, is painfully confirmed by the cursory remark of Tacitus on the abstinence of the Germans: "Numerum liberorum finire . . . flagitium habetur." *Germ.* 19.

the rank of senators to intermarry with freedwomen, for this very reason, because the females of ingenuous birth were not numerous enough to mate them.[1] With respect to the numbers of the slave population, the estimate I have referred to is not less gratuitous. The most careful and conscientious inquirer into this intricate subject declares himself unable to form any conjecture as to its amount, and though he remarks the vast size of the *families* of the Roman magnates, and the multitude also of public slaves, it is most probable that the mass of the commonalty possessed no slaves at all.[2] The nearest analogy to which we can refer, perhaps, would be that of the great Oriental cities of our time, such as Cairo or Constantinople, in which there are nearly the same striking contrasts as in ancient Rome of luxury and squalid misery; the same extravagance among the few rich in building, amusements and decorations, and the same stolid apathy among the many poor in enduring life on a crust of bread and a sup of water. Although a few pashas and emirs may dazzle the eyes of the Frank with the ostentatious display of hundreds of male and female slaves, an immense proportion of their countrymen are entirely destitute of them; and the total number of this class, as far as I can learn, forms an inconsiderable element in the whole population.[3]

Exaggerations of ancient and modern authorities.

While, therefore, there are some apparent data for the opinion not uncommonly advanced by moderate and judicious critics, that the inhabitants of Rome amounted to a million or twelve hundred thousand souls, it would seem that

[1] Dion, liv. 16., referred to in vol. iv. chapter xxxiii.

[2] Wallon, *Hist. de l'Esclavage*, &c., pt. ii. chap. 3.

[3] Mr. McCulloch, in his *Dictionary of Geography*, tells us that the estimates of the population of European Turkey by M. Boué and Mr. Urquhart (strangely discrepant as they are) are those on which most reliance may be placed. Neither of these makes any mention of the class of slaves.

the grounds for this conclusion are at best questionable, while it is hardly possible to assign more than seven hundred thousand to the extent of area on which they were domiciled.[1] Accustomed as we are to contemplate much larger collections of human beings within the limits of a single city, and to connect the idea of the capital of a vast and rich empire with a much higher amount of population, we may feel surprised and disappointed at such a result of our calculations, and the more so from the enormous numbers which the extravagance of certain earlier authorities has ascribed to imperial Rome.[2] Little stress, however, can be placed upon the vague generalities of the native writers, who indulged in the grossest hyperboles in representing the vastness, as they supposed it, of the Roman population: they were not accustomed to weigh and compare statistical

[1] There is another important statement upon this subject in the *Hist. August. in Sever.* 23.: "Moriens septem annorum canonem, ita ut quotidiana septuaginta quinque millia modiorum expendi possent, reliquit." De la Malle argues that this amount of 75,000 modii per diem was the estimated consumption of the whole population of Rome. He goes on to show that this quantity equals 1,012,000 pounds, and represents, at two pounds per head, a number of 506,000 persons. *Econ. Pol.* i. 274, 404. But Wallon, in his admirable work (ii. 84.), has shown that this standard of consumption is too high in the ratio of 5 to 3; while Dezobry, comparing it with the returns of consumption in Paris, reckons it too high in the ratio of 2 to 1. *Rome*, iii. 534. But this datum, it will be observed, refers to a period two centuries later than the Augustan; nor can we affirm that the towns and villages round Rome were not partly supplied from the granaries of the capital.

[2] Lipsius computed the population of Rome at 4,000,000; Melgotti, as late as 1781, at the same. Brotier and Gibbon have reduced it to 1,200,000, and this is the number assigned to it by Jacob: *On the Precious Metals.* That Chateaubriand should raise it to 3,000,000 might, perhaps, be expected; but I am surprised at the sum of 2,000,000 assigned to it, on very futile grounds, in the elaborate description of Rome by M. Bunsen and his learned associates. See *Rom.* i. 185. Hoeck, on more critical, but still, as I maintain, on quite erroneous principles, would raise it to 2,265,000. *Rœm. Reich.* i. 2. 390.

data; and though we have reason to believe that the amount of the inhabitants of every city was registered and made known to the government, it may be admitted that there was no general curiosity on the subject, and no conception of the moral and social purposes to which such knowledge might be applied. Even on the lowest computation which has been made, it is plain that the density of habitation in Rome must have far exceeded all modern experience; and when we remember how much the Romans lived out of doors, how gregarious were their habits, how universal their custom of frequenting the baths, visiting the theatre, and attending the games of the circus, we may well believe that the movement and aggregation of the people at certain spots was far greater than what we ordinarily witness in our own cities. We should be led to expect that the great places of public resort, such as those just mentioned, would be expressly calculated to accommodate the whole mass of the free male population; but the theatres which existed in the time of Augustus could not, at the highest statement, contain above ninety thousand, and the Circus Maximus, the general place of assemblage for all citizens within reach of Rome, on the greatest national solemnities, afforded seats at this period to not more than a hundred and fifty thousand.[1]

[1] The theatre of Pompeius held, as Pliny assures us (*H. N.* xxxvi. 15.), 40,000; but according to the *Curiosum* only 17,580; that of Balbus 11,500, according to this last authority, but the *Notitia* gives the number of 30,000. The theatre of Marcellus held, according to the *Curiosum* again, 20,000. To the Circus Maximus, Dionysius assigns (*Ant. Rom.* iii. 68.) 150,000 places: Pliny gives 260,000, and the last spurious edition of the *Curiosum*, which goes by the name of Victor, 385,000. The accommodation of the circus was probably increased from time to time by the addition of wooden galleries, as we know was the case with the Colosseum. We need not trouble ourselves with the statement of the so-called Publius Victor. In the circus the citizens were originally seated according

The circumstances of Rome do not admit of a very large population.

Nor indeed was Rome calculated, from the position it held among the cities of the empire, to attain any extraordinary population. It was neither a commercial nor a manufacturing city. It was not the emporium of a great transit trade, like Alexandria, nor the centre of exchange among a host of opulent neighbours, like Antioch. It was not surrounded by the teeming hives of life which encircled Babylon or Seleucia. Nor was it increased by the ever-accumulating wealth of all classes of society, like modern London, or by the constant tightening of the bands of centralization, by which the lifeblood of the provinces is flooded back upon Paris. It was not the natural focus of attraction for the indolent and luxurious; but every one who had the means escaped from it as often and as much as he could, and exchanged its ungenial climate for the cool breezes of the mountains or the coast, and the voluptuous recreations of a Campanian watering-place. The country around it was almost abandoned, in the imperial period, to the maintenance of cattle, and the drain of human life caused by its crowded state and baneful atmosphere was only replenished by immigration from distant shores. I will not compare it with Madrid, a mere royal residence, nor with the marble exhalation of St. Petersburg; but of modern capitals Vienna may perhaps be considered most nearly to resemble it. Its great social characteristic

to their classes; the chief magistrate presided, the senators and knights attended in their places, and every order was arrayed in its proper garb. It was, in fact, the civil camp of the Roman people. When Juvenal says, "Totam hodie Romam circus capit," his hyperbole is only the tradition of an ancient reality. Tacitus (*Ann.* xiii. 24.) expresses nearly the same idea: "Intravernt Pompeii theatrum quo magnitudinem populi viserent." Comp. Senec. *de Ira.* ii. 7.: "Illum circum in quo maximam sui partem populus ostendit." Yet from the time of the later republic women were not excluded from the theatres or circus. Plut. *Sull.* 35.; Ovid. *Art. Amand.* i. 139.; Calpurn. *Ecl.* vii. 26.

was the entire absence of a middle class, the bone and sinew of cities as well as of empires; and its population mainly consisted of the two orders of wealthy nobles on the one hand, whose means were in process of trituration under the pressure of the imperial imposts, and the poor citizens on the other, who clung to the forum and the circus for the sake of their amusements and largesses.

CHAPTER XLI.

Life in Rome.—Thronging of the streets.—Places of recreation.—Theatres, circus, and amphitheatres.—Exhibitions of wild beasts and gladiators.—Baths.—The day of a Roman noble: the forum, the campus, the bath, and the supper.—Custom of recitation.—The schools of the rhetoricians.—Authors: Livy, Virgil, Horace, Propertius, Tibullus, Ovid, each reflecting in his own way the sentiments of the Augustan age.

Thronging of the streets of Rome.

We will now proceed to people with human figures the expanse of brick and marble which has been presented to our view, and realize, as we may, the actual movement of life in the great metropolis, hearkening to the surging murmurs which still seem to resound across the abyss of eighteen centuries.[1] Rome, at the time of which we are speaking, was in the crisis of that transitional state which most great capitals have experienced, when a rapid increase in their population and the transactions of daily life has begun to outstrip the extension of their means of accommodation. The increase of numbers must necessarily multiply the operations of industry, which cross and recross each other in the streets; and though neither the commerce nor manufactures of Rome were conducted on the scale to which our ideas are accustomed, the retail traffic which passed from hand to hand, and the ordinary affairs of business and pleasure, must have caused an ever-increasing stir and circulation among the multitude of human beings collected within its walls. The uninterrupted progress of building operations, and the extension of the suburbs simultaneously with the restoration of

[1] Stat. *Sylv.* i. 1. 65.: "Magnæ vaga murmura Romæ."

the city, must have kept every avenue constantly thronged with waggons and vehicles of all sorts, engaged in the transport of cumbrous materials: the crush of these heavy-laden machines, and the portentous swinging of the long beams they carried round the corners of the narrow streets, are mentioned among the worst nuisances and even terrors of the citizen's daily walk.[1] Neither of the rival institutions of the shop and the bazaar had been developed to any great extent in ancient Rome. Numerous trades were exercised there by itinerant vendors. The street cries, which have almost ceased within our own memory in London, were rife in the city of the Cæsars. The incessant din of these discordant sounds is complained of as making life intolerable to the poor gentleman who is compelled to reside in the midst of them.[2] The streets were not contrived, nor was it possible generally to adapt them, for the passage of the well-attended litters and cumbrous carriages of the wealthy, which began to traverse them with the pomp and circumstance of our own aristocratic vehicles of a century since[3]; while the police of the city seems never to have contemplated the removal of the most obvious causes of crowd and obstruction, in the display of gymnastic and gladiatorial feats, of conjurors' tricks and the buffoonery of the lowest stage-players, amidst the most frequented thoroughfares.[4] The noble seldom crossed his threshold without a numerous train of clients and retainers; the lower people collected at the corners of the streets to hear the gossip of the day, and

Trades exercised in the streets.

Crowds of loungers and gazers.

[1] Juvenal, iii. 236, 255. In the second century it became necessary to forbid loaded waggons to traverse the city. "Orbicula cum ingentibus sarcinis urbem ingredi prohibuit." Spartian *Hadrian.* 22.

[2] Martial, i. 42., x. 3., xii. 57.

[3] The Appian Way was the fashionable drive of the Roman nobility. Hor. *Epod.* 4. 14. *Epist.* i. 6. 26.

[4] Suet. *Oct.* 74.: "Triviales ex Circo ludii."

discuss the merits of racers and dancers; the slaves hovered over the steam of the open cook-shops, or loitered on their errands, to gaze on the rude drawings or pore over the placards on the walls. The last century had filled the imperial capital with multitudes of foreigners, attracted by curiosity as much as by business to the renowned emporium of the wonders of the world, who added to the host of idlers and gazers in the streets of Rome; men of strange costumes and figures, and, when they spoke, of speech still stranger, who, while they gazed around them with awe and admiration, became themselves objects of interest to a crowd of lounging citizens. The marked though casual manner in which the throng of the streets is noticed by the Roman writers, shows in the strongest way how ordinary a feature it was of life in the city.[1]

Interruptions to traffic.

The streets, or rather the narrow and winding alleys, of Rome were miserably inadequate to the circulation of the people who thus encumbered them; for the vici were no better than lanes or alleys, and there were only two viæ, or paved ways, fit for the transport of heavy carriages, the Sacra and the Nova, in the central parts of the city. The three interior hills, the Palatine, the Aventine, and the Capitoline, were sore impediments to traffic; for no carriages could pass over them, and it may be doubted whether there were

Paucity of thoroughfares.

[1] Comp., for instance, Hor. *Sat.* ii. 6. 28.:

"Luctandum in turba, facienda injuria tardis;"

and Cicero, in the passage so important for the topography of Rome (*pro Planc.* 7.): "Equidem si quando, ût fit, jactor in turba, non illum accuso qui est in summa Sacra Via, cum ego ad Fabium fornicem impellor, sed eum qui in me ipsum incurrit et incidit." Such an illustration would not occur to an English speaker. Comp. Plaut. *Mercat.* i. 1. 8.: "Tres simitu res agendæ sunt . . . . et currendum, et pugnandum, et autem jurgandum est in via." Dezobry, *Rome*, i. 218.

even thoroughfares for foot-passengers. The occurrence of a fire or an inundation, or the casual fall of a house, must have choked the circulation of the lifeblood of the city.[1] The first, indeed, and the last of these, were accidents to which every place of human resort is liable; but the inundations of Rome were a marked and peculiar feature of her ancient existence. The central quarters of the city were founded in a morass little raised above the ordinary level of the Tiber, a river peculiarly subject to rapid and violent risings. The Romans might complain that, from the configuration of the spot, the masses of water brought down from above were flung from the right bank, where the high grounds descended directly into the stream, and driven with increased violence against the left, just at the point where nature had left an opening into the heart of the city.[2] It might have been easy to maintain a mound or levée on this bank, and curb the overflows at least of ordinary years; but the seven hills were themselves great attractors of rain, which they cast off from their sides into the pool of the Forum and the trough of the Velabrum, and this discharge it required a stupendous under-drainage to convey safely into the river.[3] When the Tiber

Demolition of houses. Fires.

Inundations.

[1] Strabo speaks very strongly of the constant fall and demolition of houses (v. 3. p. 235.): *αἱ συμπτώσεις καὶ ἐμπρήσεις καὶ μεταπράσεις, ἀδιάλειπτοι καὶ αὖται οὖσαι· καὶ γὰρ αἱ μεταπράσεις ἐκούσιοί τινες συμπτώσεις εἰσι, καταβαλόντων καὶ ἀνοικοδομούντων πρὸς τὰς ἐπιθυμίας ἕτερα ἐξ ἑτέρων.*

[2] Such is the interpretation sometimes given to the well-known lines of Horace:

"Vidimus flavum Tiberim retortis
Litore Etrusco violenter undis."

It may be more correct to understand by the litus Etruscum, the coast of the Mediterranean; but I remember the happy boldness of the Ovidian, "pro ripis litora poscunt," and am willing to adopt it here.

[3] Strabo describes the drainage of the city, v. 3. p. 235.: *τοσοῦτον*

was high, the torrents of the sewers, or cloacæ, were of course ponded back, and no ingenuity could prevent the flooding of the lower levels of the city to a depth of several feet. Nor was it in the Forum and Velabrum only that these disastrous effects were produced: the little Aqua Crabra, which descended into the city from the Porta Capena, and was carried beneath the arena of the circus into the Cloaca Maxima, often overspread the low grounds at the foot of the Cælian Hill, and the grotto of Egeria was sometimes, we may believe, thus converted into an abode more worthy of the water-nymph to whom it was dedicated.[1]

The efforts made to expand the sides of the Forum, and give more play to the lungs of the great animated machine, were very feeble and imperfect, till Julius Cæsar, and after him Augustus, removed large masses of habitations in this quarter, and threw open to traffic and movement the space thus seasonably acquired. But if the Roman people was ill accommodated in its streets, it might derive compensation in the vast constructions erected for its amusement, the ample walks and gardens devoted to its recreation, and the area which was sedulously preserved for its exercise in the Campus Martius, and the circuses of Romulus and Flaminius. The theatre of Pompeius, the first built of stone for permanent use, was rivalled by that of Balbus, and Augustus dedicated a third to the pleasures of the citizens under the

Places of recreation for the citizens. Parks and gardens.

Theatres.

δ' ἐστὶ τὸ εἰσαγώγιμον ὕδωρ διὰ τῶν ὑδραγωγείων, ὥστε ποταμοὺς διὰ τῆς πόλεως καὶ τῶν ὑπονόμων ῥεῖν. Here occurs his remarkable statement that a waggon loaded with hay could enter the great cloaca.

[1] Cicero describes the effect of a flood in this quarter in a passage of some topographical importance. "Romæ et maxime Appia ad Martis mira proluvies; Crassipedis ambulatio ablata; horti, tabernæ plurimæ; magna vis aquæ usque ad Piscinam publicam." *Ad Qu. Fr.* iii. 7.

title of the theatre of Marcellus.[1] From the enormous size of these celebrated edifices, it is clear that the idea of reserving them for dramatic performances hardly entered into the views of their builders. The Roman theatres were an institution very different from ours, where a select audience pay the price of admission to a private spectacle on however large a scale: they were the houses of the Roman people, to which every citizen claimed the right of entrance; for they were given him for his own by their munificent founders, and the performances which took place in them were provided gratuitously by the magistrates. The first object, therefore, was to seat the greatest number of the people possible; and when that was accomplished, the question followed of how they should be safely and conveniently entertained. An assemblage of 30,000 spectators, gathering excitement from the consciousness of their own multitude, could not sit tamely under the blaze of an Italian sun, tempered only by an awning, in the steam and dust of their own creating, which streams of perfumed waters were required to allay[2], to hear the formal dialogue of the ancient tragedy declaimed by human puppets from brass-lipped

[1] Ovid, *Trist.* iii. 12.: "Cumque tribus resonant terna theatra foris." The three forums are those of Julius and Augustus, with the Boarium. It is not quite clear what was the construction or what the fate of the theatre of Scaurus. It was adorned with costly pillars of marble, but the walls and seats may have been chiefly of wood; and if it was not pulled down, it must have been destroyed by fire before the erection of the Pompeian a few years later.

[2] These were recent inventions: in simpler times, according to Propertius (iv. 1. 15.):

"Non sinuosa vago pendebant vela theatro;
Pulpita solennes non oluere crocos."

In the amphitheatres which were too spacious for complete awnings the spectators were refreshed by the play of jets d'eau, which rose to the full height of the building. Senec. *Nat. Quæst.* ii. 9.

masks, staggering on the stilted cothurnus.[1] Whatever might be the case with the Greeks, it was impossible, at least for the plainer Romans, so to abstract their imaginations from the ungraceful realities thus placed before them, as to behold in them a symbolic adumbration of the heroic and the divine. For the charms, however, both of music and dancing, which are also considered pleasures of the imagination, they appear to have had a genuine, though perhaps a rude, taste. Their dramatic representations, accordingly, were mostly conducted in pantomime; this form at least of the drama was that which most flourished among them, and produced men of genius, inventors and creators in their own line. Some of the most famous of the mimic actors were themselves Romans; but the ancient prejudice against the exercise of histrionic art by citizens was never perhaps wholly overcome. Accordingly Greek names figure more conspicuously than Roman in the roll of actors on the Roman stage; and two of these, Bathyllus and Pylades, divided between them, under the mild autocracy of Augustus, the dearest sympathies and favours of the masters of the world. The rivalry of these two competitors for public applause, or rather of their admirers and adherents, broke out into tumultuous disorders, which engaged at last the interference of the emperor himself. *It is better for your government*, said one of them to him, when required to desist from a professional emulation which emperilled the tranquillity of the city—*it is better that the citizens should quarrel*

Theatrical exhibitions.

Pantomime.

[1] "Like mice roaring, to apply an expression of Mrs. F. Kemble's. I cannot reconcile the use of the mask and buskin with the keen appreciation of the graceful in form ascribed so liberally to the Greeks; nor can I understand how the audiences of Aristophanes could be the same people who gravely witnessed Agamemnon's shuffle across the stage:—*χαιαὶ τιθεὶς Τὸν σὸν πόδ', ὦναξ, Ἰλίου πορθήτορα.*

about Pylades and Bathyllus than about a Pompeius and a Cæsar.[1]

But whatever claims pantomime might have as a legitimate child of the drama, the Roman stage was invaded by another class of exhibitions, for which no such pretensions could be advanced. The grand proportions of the theatre invited more display of scenic effects than could be supplied by the chaste simplicity of the Greek chorus, in which the priests or virgins, whatever their number, presented only so many repetitions of a single type. The finer sentiment of the upper classes was overpowered by the vulgar multitude, who demanded with noisy violence the gratification of their coarse and rude tastes.[2] Processions swept before their eyes of horses and chariots, of wild and unfamiliar animals; the long show of a triumph wound its way across the stage; the spoils of captured cities, and the figures of the cities themselves were represented in painting or sculpture; the boards were occupied in every interval of more serious entertainment by crowds of rope-dancers, conjurors, boxers, clowns, and posture-makers, men who walked on their hands, or stood on their heads, or let themselves be whirled aloft by machinery, or suspended upon wires, or who danced on stilts, or exhibited feats of skill with cups and balls.[3] But these degenerate spectacles were not the

Spectacles.

[1] Dion, liv. 17.; Macrob. *Saturn.* ii. 7.

[2] Hor. *Epist.* ii. 1. 184.:

"Indocti stolidique, et depugnare parati
Si discordet eques, media inter carmina poscunt
Aut ursum aut pugiles," &c.

[3] The learned Bulenger (*de Theatro*, i. 34. foll. in Græv. *Thes.*) has given a list of the kinds of performers who thus encroached upon the domain of Melpomene and Thalia: "Ingens utique hujusmodi hominum sylva fuit, quorum alii miracula patrarent, Græci vocant θαυματοποιούς, Latini præstigiatores, acetabulos, alii per catadromum decurrerent, cernuarent, petauristæ essent, petaminarii, grallatores, phonasci, pantomimi, grotochoraulæ, citharœdi, satyri, lentuli, tibicines, parasiti, atellani, dicticsi, ridiculi, rhapsodi, urbicarii, psal-

lowest degradation to which the theatres were subjected. They were polluted with the grossest indecencies; and the luxury of the stage, as the Romans delicately phrased it, drew down the loudest indignation of the reformers of a later age.[1] Hitherto at least legislators and moralists had been content with branding with civil infamy the instruments of the people's licentious pleasures; but the pretext even for this was rather the supposed baseness of exhibiting oneself for money, than the iniquity of the performances themselves. The legitimate drama, which was still an exercise of skill among the Romans, was relegated, perhaps, to the smaller theatres of wood, which were erected year by year for temporary use. There were also certain private theatres, in which knights and senators could exercise their genius for singing and acting without incurring the stigma of public representation.

The amphitheatres.

The appetite for grandeur and magnificence, developed so rapidly among the Romans by the pride of opulence and power, was stimulated by the rivalry of the great nobles. The bold and ingenious tribune Curio, whose talents found a more fatal arena in the contests of the civil wars, was the first to imagine the form of the double hemicycle, which he executed with an immense wooden structure and a mechanical apparatus, by which two theatres, after doing their legitimate duty to the drama, could be wheeled front to front, and combined

triæ, sabulones, planipedes, mimi, mastigophori, apinarii, moriones, miriones, sanniones, iambi, salii, musici, poetæ, curiones, præcones, agonarchæ:" all which he proceeds severally to describe.

[1] This coarseness dated, indeed, from a period of high and honourable feeling. The impurities of the Floralia offended the elder Cato, according to Martial's well-known epigram, i. 1. The same licentiousness continued to please, through a period of six centuries, down to the time of Ausonius, who says,

"Nec non lascivi Floralia læta theatri,
Quæ spectasse volunt qui voluisse negant."

into a single amphitheatre for gladiatorial spectacles.[1] There can be no doubt that this extraordinary edifice was adapted to contain many thousands of spectators; and there are few, perhaps, even of our own engineers, who build tubular bridges, and suspend acres of iron network over our heads, who would not shrink from the problem of moving the population of a great city on a single pair of pivots.[2] The amphitheatre of Julius Cæsar in the Campus was of wood also, and this, as well as its predecessors, seems to have been taken down after serving the purpose of the day. It remained for Statilius Taurus, the legate of Augustus, to construct the first edifice of this character in stone, and to bequeath to future ages the original model of the magnificent structures which bear that name, some of which still attest the grandeur of the empire in her provinces; but the most amazing specimen of which, and indeed the noblest existing monument of all ancient architecture, is the glorious Colosseum at Rome.[3] Like most of the splendid buildings of this period, the amphitheatre of Taurus was erected in the Campus Martius, the interior of the city not admitting of the dedication of so large a space to the purpose; though it was rumoured indeed that Augustus had purposed to crown the series of his public works by an edifice of this nature, in the centre of his capital.[3] While the amphitheatre, however, was

[1] Plin. *Hist. Nat.* xxxvi. 24. § 8.: "Theatra juxta fecit amplissima e ligno, cardinum singulorum versatili suspensa libramento, in quibus utrisque ante-meridiano ludorum spectaculo edito inter sese aversis, ne invicem obstreperent scenæ, repente circumactis ut contra starent postremo jam die discedentibus tabulis et cornibus in se coeuntibus, faciebat amphitheatrum, et gladiatorum spectacula edebat, ipsum magis auctoratum populum Romanum circumferens."

[2] Plin. *l. c.*: "Super omnia erit populi furor, sedere ausa tam infida instabilique sede . . . . ecce populus Romanus universus, velut duobus navigiis impositus, binis cardinibus sustinetur."

[3] Suetonius, remarking particularly that the Colosseum, or amphitheatre of Vespasian, was in the centre of the city, tells us that it was erected there in order to carry out a design of Augustus. *Vespas.* 9.

a novel invention, the circus, to which it was in a manner supplementary, was one of the most ancient institutions of the city. The founder himself had convened his subjects in the Murcian valley, beneath his cabin on the Palatine, to celebrate games of riding, hunting, and charioteering. The inclosure in which these shows were annually exhibited was an oblong, curved at the further end, above six hundred yards in length, but comparatively narrow. The seats which ranged round the two larger sides and extremity of this area were originally cut out of the rising ground, and covered with turf: less rude accommodation was afterwards supplied by wooden scaffoldings; but the whole space was eventually surrounded by masonry, and decorated with all the forms and members of Roman architecture.

The Circus.

The arena was adapted for chariot racing by a partition, a dwarf wall, surmounted with various emblematic devices, which ran along the middle and terminated at either end in goals or ornamented pillars, round which the contending cars were driven a stated number of times. The eye of the spectator, from his position aloft, was carried over this spinal ridge, and he obtained a complete view of the contest, which thus passed and repassed amidst clouds of dust and roars of sympathizing excitement, before his feet. The Romans had from the first an intense delight in these races; and many of the most graphic passages of their poets describe the ardour of the horses, the emulation of their drivers, and the tumultuous enthusiasm of the spectators.[1] These contests main-

Chariot races.

[1] Most of us have been struck with the spectacle of an audience of three or four thousand in one of our theatres rising simultaneously at the first sound of the national anthem. The Romans were deeply impressed with the grandeur of such a movement, on the very different scale with which they were familiar. Comp. Stat. *Theb.* vi. 448.:

"Subit astra fragor, cœlumque tremiscit,
Omniaque excusso patuere sedilia vulgo."

tained their interest from the cradle to the very grave of the Roman people. The circus of Constantinople, under the Greek designation of Hippodrome, was copied from the pattern of the Roman; and the *factions* which divided the favour of the tribes almost from the beginning of the empire, continued to agitate the city of Theodosius and Justinian. The citizens were never satiated with this spectacle, and could sit without flagging through a hundred heats, which the liberality of the exhibitor sometimes provided for them. But the races were more commonly varied with contests of other kinds. All the varieties of the Greek Pancratium, such as boxing, wrestling, and running, were exhibited in the circus; gladiators fought one another with naked swords, sometimes in single combat, sometimes with opposing bands. The immense size of the arena, unfavourable for the exhibition of the duel, was turned to advantage for the display of multitudes of wild animals, which were let loose in it to be transfixed with spears and arrows. This practice seems to date from the sixth century, when victorious generals first returned to Rome from the far regions of the East, and ingratiated themselves with the populace by exhibiting strange monsters of unknown continents, lions and elephants, giraffes and hippopotami. As in other things, the rivalry of the nobles soon displayed itself in the number of these creatures they produced for massacre; and the favour of the citizens appears to have followed with constancy the champion who treated them with the largest effusion of blood. The circus was too spacious for the eye to gloat on the expression of conflicting passions, and watch the last ebbings of life; but the amphitheatre brought the greatest possible number of spectators within easy distance of the dead and dying, and fostered the passion for the sight of blood, which

Exhibition of wild beasts.

continued for centuries to vie in interest with the harmless excitement of the race.[1]

Gladiatorial combats.

The idea of the theatre is representation and illusion, and the stage is, as it were, magic ground, over which the imagination may glance without restraint and wander at will, *from Thebes to Athens*, from the present to the past or future. But in the amphitheatre all is reality. The citizen, seated face to face with his fellow citizens, could not for a moment forget either his country or his times. The spectacles here presented to him made no appeal to the discursive faculties; they brought before his senses, in all the hardness of actuality, the consummation of those efforts of strength, skill, and dexterity in the use of arms, to which much of his own time and thoughts was necessarily directed. The exhibition of gladiatorial combats, which preceded the departure of a general for a foreign campaign, was part of the soldier's training (and every citizen was regarded as a soldier), from which he received the last finish of his education, and was taught to regard wounds and death as the natural incidents of his calling. These were probably the most ancient of the military spectacles. The combats of wild beasts, and of men with beasts, were a corruption of the noble science of war which the gladiatorial contests were supposed to teach; they were a concession to the prurient appetite for excitement, engendered by an indulgence which, however natural in a rude and barbarous age, was actually hardening and degrading. The interest these exercises at first naturally excited degenerated into a mere passion for the sight of death; and as the imagination

[1] Favourable as the long extent of the circus might have been for the exhibition of pageants and processions, the people, in their eagerness for spectacles of bloodshed, witnessed them here with great impatience. M. Seneca thus closes one of his prefaces: "Sed jam non sustineo vos morari. Scio quam odiosa res sit circensibus pompa." *Controv.* i. præf.

can never be wholly inactive in the face of the barest realities, the Romans learnt to feast their thoughts on the deepest mystery of humanity, and to pry with insatiate curiosity into the secrets of the last moments of existence: in proportion as they lost their faith in a future life, they became more restlessly inquisitive into the conditions of the present.

Sentiments of antiquity on these bloody spectacles.

The eagerness with which the great mass of the citizens crowded to witness these bloody shows, on every occasion of their exhibition, became one of the most striking features of Roman society, and none of their customs has attracted more of the notice of the ancient writers who profess to describe the manners of their times. By them they are often represented as an idle and frivolous recreation, unworthy of the great nation of kings; nor do we find the excuse officially offered for the combats of gladiators, as a means of cherishing courage and fostering the ruder virtues of antiquity, generally put forward as their apology by private moralists.[1] Men of reflection, who were far themselves from sharing the vulgar delight in these horrid spectacles (and it should be noticed that no Roman author speaks of them with favour, or gloats with interest on their abominations), acquiesced in the belief that it was necessary to amuse the multitude, and was better to gratify them with any indulgence they craved for, than risk the more fearful

[1] Capitolin. *Max. et Balb.* 8. Cicero (*Tusc.* ii. 17.), even while offering this vindication, cannot help remarking: "Crudele gladiatorium spectaculum nonnullis videri solet; et haud scio an ita sit, ut nunc fit." Compare also his remarks to Marius (*ad Div.* vii. 1.): "quæ potest homini polito esse delectatio quum homo imbecillus a valentissima bestia laniatur," &c. See also a passage to the same effect in Seneca, *de Brev. Vit.* 13., and the preaching of Apollonius at Athens (Philostr. *Vit. Apoll.* iv. 22.). Tertullian and Prudentius have some declamations against the exhibition; but far the most interesting passage on the subject is the description in St. Augustine's *Confessions* (vi 13.) of the youth Alypius yielding against his will to its horrid fascination: "Quid plura? spectavit, clamavit, exarsit," &c.

consequences of thwarting and controlling them. The blood thus shed on the arena was the price they were content to pay for the safety and tranquillity of the realm. In theory, at least, the men who were thus thrust forth to engage the wild beasts were condemned criminals: but it was often necessary to hire volunteers to complete the numbers required; and this seems to prove that the advantage was generally on the side of the human combatant. The gladiators, although their profession might be traced by antiquarians to the combats of armed slaves around the pyre of their master, ending in their mutual destruction in his honour, were devoted to no certain death.[1] They were generally slaves purchased for the purpose, but not unfrequently free men tempted by liberal wages; and they were in either case too costly articles to be thrown away with indifference. They were entitled to their discharge after a few years' service, and their profession was regarded in many respects as a public service, conducted under fixed regulations.[2] Under the emperors, indeed, express laws were required to moderate the ardour even of knights and senators to *descend into the arena*, where they delighted to exhibit their courage and address in the face of danger. Such was the ferocity engendered by the habitual use of arms, so soothing to the swordsman's vanity the consciousness of skill and valour, so stimulating to his pride the thunders of applause from a hundred thousand admirers, that the practice of mortal combat, however unsophisticated nature may blench at its horrors, was actually the source perhaps of more pleasure than pain to these Roman prize-fighters. If the companions of Spartacus revolted and slew their trainers and mas-

[1] Servius in *Æneid.* iii. 67.; Tertull. *de Spectac.* 12.

[2] Hor. *Epist.* i. 1. 4.: "Veianius armis
Herculis ad postem fixis, latet abditus agro,
Ne populum extrema toties exoret arena."

ters, we may set against this instance of despair and fury the devotion of the gladiators of Antonius, who cut their way through so many obstacles in an effort to succour him. But the effect of such shows on the spectators themselves was wholly evil; for while they utterly failed in supplying the bastard courage for which they were said to be designed, they destroyed the nerve of sympathy for suffering, which distinguishes the human from the brute creation.

Fondness of the Romans for the bath.

The Romans, however, had another popular passion, innocent at least of blood and pain, but perhaps little less pernicious to the moral character, in the excess to which they indulged it, than that which we have just reviewed. This was their universal appetite for the bath, a refreshment which degenerated, in their immoderate use of it, into an enervating luxury. The houses of the opulent were always furnished with chambers for this purpose; they had their warm and cold baths, as well as their steam apparatus; and the application of oil and perfumes was equally universal among them. From the earliest times there were perhaps places of more general resort, where the plebeian paid a trifling sum for the enjoyment of this luxury; and among other ways of courting popular favour was that of subsidizing the owners of these common baths, and giving the people the free use of them for one or more days. The extent to which Agrippa carried this mode of bribery has been before mentioned. Besides the erection of lesser baths to the number of a hundred and seventy, he was the first to construct public establishments of the kind, or Thermæ, in which the citizens might assemble in large numbers, and combine the pleasure of purification with the exercise of gymnastic sports, while at the same time they might be amused by the contemplation of paintings and sculptures, and by listening to song and music. The Roman, however,

had his peculiar notion of personal dignity, and it was not without a feeling of uneasiness that he stripped himself in public below the waist, however accustomed he might be to exhibit his chest and shoulders in the performance of his manly exercises.[1] The baths of Mæcenas and Agrippa remained without rivals for more than one generation, though they were ultimately supplanted by imperial constructions on a far grander scale. In the time of Augustus the resort of women to the public baths was forbidden, if indeed such an indecorum had yet been imagined.

The manners of the baths.

At a later period, whatever might be the absence of costume among the men, the women at least were partially covered.[2] An ingenious writer has remarked on the effect produced on the spirits by the action of air and water upon the naked body. The unusual lightness and coolness, the disembarrassment of the limbs, the elasticity of the circulation, combine to stimulate the sensibility of the nervous system. Hence the Thermæ of the great city resounded with the shouts and laughter of the bathers, who when risen from the water and resigned to the manipulations of the barbers and perfumers, gazed with voluptuous languor on the brilliant decorations of the halls around them, or listened with charmed ears to the singers and musicians, and even to the poets who presumed on their helplessness to recite to them their choicest compositions.[3]

Such were the amusements of the great mass of the citizens; and their amusements were now their most serious occupations. But the magnanimous

[1] Valerius Maximus (ii. 1. 7.) states as an instance of this modest reserve that, "aliquando nec pater cum filio, nec socer cum genero lavabatur." The dislike of the Romans, at their best period, to be represented by naked statues, has been already noticed.

[2] Martial, iii. 87. See Walckenaer, *Vie d'Horace*, i. 126.

[3] Two of the most interesting passages on the manners of the baths are Senec. *Ep.* 56. and Petron. *Satyr.* 73. See Walckenaer, *l.c.*

Roman of the caste which once ruled the world, and was still permitted to administer it, continued to be trained on other principles, and was still taught to combine in no unfair proportions attention to business, cultivation of mind, the exercise of the body, and indulgence in social relaxations. Bred up in the traditions of an antique education, these men could not soon be reduced, under any change of government, to become mere loungers and triflers. Augustus at least had no such aim or desire; on the contrary, he was anxious to employ all men of rank and breeding in practical business, while at the same time he proposed to them his own example as a follower both of the Muses and the Graces. The Roman noble rose ordinarily at daybreak, and received at his levée the crowd of clients and retainers who had thronged his doorstep from the hours of darkness.[1] A few words of greeting were expected on either side, and then, as the sun mounted the eastern sky, he descended from his elevated mansion into the Forum.[2] He might walk surrounded by the still lingering crowd, or he might be carried in a litter; but to ride in a wheeled vehicle on such occasions was no Roman fashion.[3] Once arrived in the Forum he was quickly immersed in the business of the day. He presided as a judge in one of the basilicas, or he appeared himself before the judges

The day of a Roman noble.

The business of the morning.

[1] For the disposal of the Roman's day see particularly Martial, iv. 8.: "Prima salutantes atque altera continet hora," &c. Comp. the younger Pliny's account of his uncle's day. *Epist.* iii. 5.; cf. iii. 1.

[2] The phrases, *descendere in forum* or *in campum* (so Hor. iii. 1., "Descendit in campum petitor") refer to the comparative level of the noble mansion on the hill, and the public places in the valley or plain. Champagny, *Césars*, ii. 256.

[3] The Romans rode in carriages on a journey, but rarely for amusement, and never within the city. Even beyond the walls it was considered disreputable to hold the reins oneself, such being the occupation of the slave or hired driver. Juvenal ranks the consul, who creeps out at night to drive his own chariot, with the most de

as an advocate, a witness, or a suitor. He transacted his private affairs with his banker or notary; he perused the Public Journal of yesterday, and inquired how his friend's cause had sped before the tribunal of the prætor. At every step he crossed the path of some of the notables of his own class, and the news of the day and interests of the hour were discussed between them with dignified politeness.

Such were the morning occupations of a *dies fastus*, or working day: the holy-day had its appropriate occupation in attendance on the temple services, in offering prayers for the safety of the emperor and people, in sprinkling frankincense on the altar, and, on occasions of special devotion, appeasing the gods with a sacrifice. But all transactions of business, secular or *divine*, ceased at once when the voice of the herald on the steps of the Hostilian Curia proclaimed that the shadow of the sun had passed the line on the pavement before him, which marked the hour of midday.[1] Every door was now closed; every citizen, at least in summer, plunged into the dark recess of his sleeping chamber for the enjoyment of his meridian slumber. The midday siesta generally terminated the affairs of the day, and every man was now released from duty and free to devote himself, on rising again, to relaxation or amusement till the return of night. If the senate had been used sometimes to prolong or renew its sittings, there was a rule that after the tenth hour, or

The midday siesta.

graded of characters: that he should venture to drive by daylight, while still in office, is an excess of turpitude transcending the imagination of the most sarcastic painter of manners as they were. And this was a hundred years later than the age of Augustus. See Juvenal, viii. 145. foll.

[1] I allude to the passage, well known to the topographers, in Pliny, *Hist. Nat.* vii. 60.: "Meridies . . . accenso consulum id pronuntiante, quum a curia inter rostra et Græcostasim prospexisset solem." The reader will observe that this refers in strictness to an earlier period, and that the Curia Hostilia was destroyed in the year 52 B.C.

four o'clock, no new business could be brought before it, and we are told of Asinius Pollio, that he would not even open a letter after that hour.[1] Meanwhile Rome had awakened to amusements and recreation, and the grave man of business had his amusements as well as the idler of the Forum. The exercises of the Field of Mars were the relaxation of the soldiers of the republic; and when the urban populace had withdrawn from military service, the traditions of the Campus were still cherished by the upper ranks, and the practice of its mimic war confined, perhaps, exclusively to them. The swimming, running, riding, and javelin-throwing of this public ground became under the emperors a fashion of the nobility[2]: the populace had no taste for such labours, and witnessed with some surprise the toils to which men voluntarily devoted themselves, who possessed slaves to relieve them from the most ordinary exertions. But the young competitors in these athletic contests were not without a throng of spectators: the porticos which bordered the field were crowded with the elder people and the women, who shunned the heat of the declining sun: many a private dwelling looked upon it from the opposite side of the river, which was esteemed on that account a desirable place of residence. Augustus had promised his favour to every revival of the gallant customs of antiquity, and all the Roman world that lived in his smiles hastened to the scene of these antique amusements to gratify the emperor, if not to amuse themselves.[3]

The afternoon: the Field of Mars.

[1] Senec. *de Tranq. Anim.* 15.: "Quidam nullum non diem inter et otium et curas dividebant; qualem Pollionem Asinium, oratorem magnum, meminimus, quem nulla res ultra decimam retinuit; ne epistolas quidem post eam horam legebat, ne quid novæ curæ nascerentur."

[2] See for the exercises of the Campus, Hor. *Od.* i. 13., *Art. Poet.* 379.

[3] Horace knew how to please his patron by frequent allusions to

The ancients, it was said, had made choice of the Field of Mars for the scene of their mimic warfare for the convenience of the stream of the Tiber, in which the wearied combatants might wash off the sweat and dust, and return to their companions in the glow of recruited health and vigour.[1] But the youth of Rome in more refined days were not satisfied with these genial ablutions. They resorted to warm and vapour baths, to the use of perfumes and cosmetics, to enhance the luxury of refreshment; and sought by various exquisite devices to stimulate the appetite for the banquet which crowned the evening.

The evening: the supper.

The cœna or supper of the Romans deserves to be described as a national institution: it had from the first its prescriptions and traditions, its laws and usages; it was sanctified by religious observances, and its whole system of etiquette was held as binding as if it had had a religious significance.[2] Under the protection of the gods to whom they poured their libations, friends met together for the recreation equally of mind and body. If the conversation flagged, it was relieved by the aid of minstrels, who

the exercises of the Campus. It is probable that they declined in interest at a subsequent period, and the mention of them becomes comparatively rare. But they still constituted a part of the ordinary occupation of the day in the second century of the empire (Martial, ii. 14. iv. 8.), and were not disused in the third. Trebell. Poll. *Claud.* 13.: "Fecerat hoc adolescens in militia quum ludicro Martiali in campo luctamen inter fortissimos quosque celebraret."

[1] Veget. *de Re Milit.* i. 10. What life and spirit this gives to Virgil's lines at the end of the ninth book of the Æneid:

"Tum toto corpore sudor
Liquitur, et piceum, nec respirare potestas,
Flumen agit; fessos quatit æger anhelitos artus:
Tum demum præceps saltu sese omnibus armis
In fluvium dedit: ille suo cum gurgite flavo
Accepit venientem, ac mollibus extulit undis,
Et lætum sociis abluta cæde remisit."

[2] Hor. *Sat.* ii. 6. 66.:

"Ante Larem proprium vescor, vernasque loquaces
Pasco libatis dapibus."

Comp. Ovid. *Fast.* ii. 631.

recited the famous deeds of the national heroes[1]: but in the best days of the republic the guests of the noble Roman were men of speech not less than of deeds, men consummately trained in all the knowledge of their times; and we may imagine there was more room to fear lest their converse should degenerate into the argumentative and didactic than languish from the want of matter or interest. It is probable, however, that the table-talk of the higher classes at Rome was peculiarly terse and epigrammatic. Many specimens have been preserved to us of the dry sententious style which they seemed to have cultivated: their remarks on life and manners were commonly conveyed in solemn or caustic aphorisms, and they condemned as undignified and Greekish any superfluous abundance of words. The graceful and flowing conversations of Cicero's dialogues were imitated from Athenian writings, rather than drawn after the types of actual life around him. *People at supper*, said Varro, himself not the least sententious of his nation, *should neither be loquacious nor mute; eloquence is for the forum, silence for the bedchamber.*[2] Another rule of the same master of etiquette, that the number of the guests should not exceed nine, the number of the Muses, nor fall short of three, the number of the Graces, was dictated by a sense of the proprieties of the Roman banquet, which the love of ostentation and pride of wealth were now constantly violating. Luxury and the appetite for excitement were engaged in multiplying occasions of more than ordinary festivity, on which the most rigid of the sumptuary laws allowed a wider licence to the expenses of the table. On such high days the number of the guests was limited neither by law nor custom: the entertainer, the master or

[1] Cic. *Tusc.* i. 2., iv. 2.; Nonius, in Assa voce; Val. Max. ii. 1. 10.
[2] Varro, quoted by A. Gellius, xiii. 11.

father, as he was called, of the supper, was required to abdicate the ordinary functions of host, and, according to the Greek custom, *a king of the wine*, or *arbiter of drinking*, was chosen from among themselves by lot, or for his convivial qualities, by the Bacchanalian crew around him.[1]

Coarseness of the luxury of the Roman table.

Our own more polished but not unmanly taste must look with amazement and even disgust at the convivial excesses of the Romans at this period, such as they have themselves represented them. Their luxury was a coarse and low imitation of Greek voluptuousness; and for nothing perhaps did the Greeks more despise their rude conquerors than for the manifest failure of their attempts at imitating the vices of their betters. The Romans vied with one another in the cost rather than the elegance of their banquets, and accumulated with absurd pride the rarest and most expensive viands on their boards, to excite the admiration of their parasites, not to gratify their palates. Cleopatra's famous conceit, in dissolving the pearl in vinegar, may have been the fine satire of an elegant Grecian on the tasteless extravagance of her barbarian lover. Antonius, indeed, though he degraded himself to the manners of a gladiator, was a man of noble birth, and might have imbibed purer tastes at the tables of the men of his own class; but the establishment of the imperial regime thrust into the high places of society a number of low-born upstarts, the sons of the speculators and contractors of the preceding generation, who knew not how to dispense with grace the unbounded wealth amassed by their

[1] Cicero, *de Senect.* 14.: "Me vero magisteria delectant a majoribus instituta." This refers, I conceive, to the legitimate ordering of the feast by the host himself: the "pater cœnæ" (Hor. *Sat.* ii. 8. 7.). The Thaliarchus, or, as the Romans styled him, "Rex vini," represented a Greek innovation.

sires.[1] Augustus would fain have restrained these excesses, which shamed the dignified reserve he wished to characterize his court: he strove by counsel and example, as well as by formal enactments, to train his people in the simpler tastes of the olden time, refined but not yet enervated by the infusion of Hellenic culture.[2] His laws indeed shared the fate of the sumptuary regulations of his predecessors, and soon passed from neglect into oblivion. His example was too austere, perhaps, to be generally followed even by the most sedulous of his own courtiers. He ate but little, and was content with the simplest fare: his bread was of the second quality, at a time when the best was far less fine than ours; and he was satisfied with dining on a few small fishes, curds or cheese, figs and dates, taken at any hour when he had an appetite rather than at regular and formal meals. He was careful, however, to keep a moderately furnished table for his associates, at which he commonly appeared himself, though, as has been before remarked, he was often the last to arrive, and the first to retire from it.[4]

Ordering of a Roman supper.

The ordinary arrangement of a Roman supper consisted of three low couches, on three sides of a low table, at which the attendant slaves could minister without incommoding the recumbent guests. Upon each couch three persons reclined, a mode which had been introduced from Greece, where it had been in use for centuries, though not from the heroic times. The Egyptians

[1] Tacitus (*Ann.* xii. 55.) refers to the "luxus mensæ a fine Actiaci belli . . . . per C annos profusis sumptibus exerciti."

[2] The leges Juliæ allowed 200 sesterces for a repast on ordinary days, 300 on holidays, 1000 for special occasions, such as a wedding, &c. Gell. ii. 24.

[3] De la Malle, in his work often cited, has some elaborate calculations of the comparative loss of nourishment in a given weight of flour from the imperfect grinding of the Romans.

[4] Suet. *Oct.* 74, 76.

and Persians sat at meat; so till the Greeks corrupted them did also the Jews: the poetical traditions of Hellas represented the gods as sitting at their celestial banquets. The Macedonians, also, down to the time of Alexander, are said to have adopted the more ordinary practice; and such was the custom at Rome till a late period.[1] When the men first allowed themselves the indulgence of reclining, they required boys and women to maintain an erect posture, from notions of delicacy; but in the time of Augustus no such distinction was observed, and the inferiority of the weaker sex was only marked by setting them together on one of the side couches, the place of honour being always in the centre. Reclined on stuffed and cushioned sofas, leaning on the left elbow, the neck and right arm bare, and his sandals removed, the Roman abandoned himself, after the exhaustion of the palæstra and the bath, to all the luxury of languor. His slaves relieved him from every effort, however trifling[2]: they carved for him, filled his cup for him, supplied every dish for him with such fragmentary viands as he could raise to his mouth with his fingers only, and poured water on his hands at every remove.[3] Men of genius and learning might

[1] The primitive Romans sat at meals. Serv. *in Æn.* vii. 176. Afterwards men reclined, boys and women sat; finally women reclined also. Val. Max. ii. 1, 2. Homer represents his heroes as sitting; and such was the posture of the gods of Olympus. Catull. lxiv. 304. "Qui postquam niveos flexerunt sedibus artus."

[2] The structor or carver was an important officer at the sideboard. Carving was even taught as an art, which, as the ancients had no forks (*χειρονομᾶν*, to manipulate, was the Greek term for it), must have required grace as well as dexterity. Moreau de Jonnès observes, with some reason, that the invention of the fork, apparently so simple, deserves to be considered difficult and recondite. The Chinese, with their ancient and elaborate civilization, have failed to attain to it. "Cinquante siècles ne leur ont pas permis d'imaginer l'usage des fourchettes." *Statist. des Anciens Peuples*, p. 506.

[3] For some of the most extravagant refinements of the luxury of the table see Martial, iii. 82.;

amuse themselves with conversation only; those to whom this resource was insufficient had other means of entertainment to resort to. Music and dancing were performed before them; actors and clowns exhibited in their presence; dwarfs and hunchbacks were introduced to make sport for them; Augustus himself sometimes escaped from these levities by playing at dice between the courses; but the stale wit and practical humour, with which in many houses the banquet seems to have been seasoned, give us a lower idea of the manners of Roman gentlemen than any perhaps of these trifling pastimes.[1] The vulgarity, however, of the revellers of Rome was less shocking than their indecency, and nothing perhaps contributed more to break down the sense of dignity and self-respect, the last safeguard of Pagan virtue, than the easy familiarity engendered by their attitude at meals.

Some persons, indeed, men no doubt of peculiar assurance and conceit, ventured to startle the voluptuous languor of the supper-table by repeating their own compositions to the captive guests.[2] But for the most part the last sentiments of expiring liberty revolted against this odious oppression. The Romans compounded for the inviolate sanctity of their convivial hours by surrendering to the inevitable enemy a solid portion of the day. They resigned themselves to the task of listening as a part of the business of the morning. The custom of re-

Custom of recitation.

> "Stat exoletus suggeritque ructanti
> Pinnas rubentes cuspidesque lentisci. . . .
> Percurrit agili corpus arte tractatrix,
> Manumque doctam spargit omnibus membris. . . ."

[1] Suet. *Oct.* 77.; Macrob. *Saturn.* ii. 4. Horace's wit is exquisite, but it must be allowed that his convivial humour is intolerable. The silliness of his butt Nasidienus is far less odious than the vulgarity of his genteel associates. Comp. the supper, *Sat.* ii. 8., and the festive scenes in the journey to Brundisium, *Sat.* i. 5.

[2] Cic. *ad Att.* xvi. 2. in fin.

citation is said to have been introduced by Asinius Pollio, the prince, at this period, of Roman literature.[1] It was in fact a practice of somewhat older date; the influence, however, of so distinguished a patron may have brought it more into fashion, and established it as a permanent institution. The rich and noble author could easily secure himself an audience by merely throwing wide his doors, and he was hardly less secure of their acclamations; but when the usage descended to the inferior herd of literature, who were obliged to hire rooms to receive the guests they summoned, it was far more difficult to attract flattering or even courteous listeners.[2] Such, however, was the influence of the mode, that even under these discouragements, the practice seems to have maintained its ground; attendance on these solemn occasions, whatever natural jeers or murmurs they excited, was esteemed a social duty, and among other habits of higher importance, though always evil spoken of, it was still faithfully observed. Much, indeed, of the best poetry of the day was thus recited as an experiment on the taste of the town; and the practice served in some degree the purpose of our literary reviews, in pointing out the works which deserved to be purchased and perused. But it owed its popularity still more, perhaps, to the national love of acting and declamation; and while few of the company might care to listen to the reciter's language, all intently observed his gestures and the studied modulations of his voice. It was the glory of the author to throw his audience into a fever of excitement, till they screamed and gesticulated themselves in turn, and almost overwhelmed the blushing

[1] M. Seneca, *Controv.* iv. præm.

[2] Plin. *Epist.* viii. 12.; Juvenal, vii. 40.; Tac. *de Orator.* 9.: Quorum exitus hic est, ut . . . . rogare ultro et ambire cogatur, ut sint qui dignentur audire: et ne id quidem gratis; nam et domum mutuatur et auditorium exstruit et subsellia conducit et libellos dispergit," &c.

declaimer with the vehement demonstrations of their applause.[1] The tendency of such a system to stimulate false taste and discountenance modest merit may easily be imagined. In the age of Augustus the evil had not reached its highest point. Horace, who describes himself as weakly in voice and limb, and devoid of personal graces, might shrink from the ordeal of recitation from a consciousness of these deficiencies rather than from greater delicacy of taste; but his calm and judicious style of composition was not the less honourably appreciated for the want of these spurious recommendations.[2] At a later period the ear of the public was accessible perhaps by no other means.

Habits of declamation.

The Romans, it will be observed, were not a people of readers: the invention of printing would have been thrown away upon them; or rather, had they had a strong appetency for reading, they would undoubtedly have discovered the means (on the verge of which they arrived from more sides than one) of abridging the labour of copying, and diminishing the cost of books.[3] But to hear recitation with its kindred accompaniment of action, of which they were earnest and critical admirers, was to them a genuine delight, nor were they content with being merely hearers. With the buoyant spirits and healthy enjoyment of children, the Romans seem to have derived pleasure, akin to that of children, in the free exercise of their voice and lungs. If the

[1] Hor. *Art. Poet.* 428.: "Pulchre, bene, recte!" Pers. i. 49.; Juvenal, vi. 582.; Martial, i. 77.: "At circum pulpita nostra Et steriles cathedras basia sola crepant."

[2] Hor. *Sat.* i. 4. 22.: "Cum mea nemo Scripta legat vulgo recitare timentis." Comp *Epist.* i. 19. 39.

[3] The figures on the tesseræ or tablets of admission to the theatres were undoubtedly stamped, and there is considerable reason to believe that a method had been discovered of taking off copies of a drawing or painting. See Plin. *Hist. Nat.* xxxv. 2.: "M. Varro beniuissimo invento .... non passus intercidere figuras .... in omnes terras misit ut præsentes essent ubique ...."

Greeks were great talkers, the Romans were eminently a nation of speakers. Their earliest education was directed to conning and repeating old saws and legends; such as the laws of the twelve tables, the national ballads, and rhythmical histories; and from their tender years they were trained to the practice of debate and declamation. Rhetoric was taught them by technical rules, and reduced, indeed, to so formal a system, that children of twelve years, or even under, could come forward and deliver set harangues on the most solemn of public occasions. Julius Cæsar pronounced the funeral oration of his aunt in his twelfth year; nor was Augustus older when he performed a similar feat. But, in fact, such *tours de force* were merely school exercises; the form, the turns of thoughts, the cadences, everything but the actual words was modelled to a pattern, allowing neither opportunity for genius nor risk of failure. Under the free state these scholastic prolusions were soon exchanged for the genuine warfare of the forum or the tribunals. The ever-varying demands of those mighty arenas on the talents and resources of the noble Roman required incessant study, and compelled the orator to devote every leisure hour to the toils of practice and preparation. Augustus never allowed a day to pass without reserving an hour for declamation, to keep his lungs in regular exercise, and maintain the armoury of dialectics furbished for ready use. Yet the speeches of Augustus were not discussions or contests, but merely proclamations of his policy. With the firmer application of a central authority to control the vices of the magistrates, and check the ebullitions of party violence, the occupation of his contemporary orators was lost.[1] The age

[1] The 37th chapter of the treatise *De Oratoribus* is an eloquent exposition of this thesis: "Quæ mala sicut non accidere melius est, isque optimus civitatis status habendus est quo nihil tale patimur; ita, quum acciderent, ingentem eloquentiæ materiam subministra-

of the first princeps was perhaps the period of the lowest decline of Roman eloquence; it rose again, as we shall see, to a state of feverish activity under the reign of his successors, when the favour of the emperor might be secured by ardour in denouncing crimes against his honour and safety. The law of Treason evoked a more copious stream of rhetoric than those of Violence and Rapine. Nevertheless, the want of worthy subjects for their powers seems to have availed little in checking the passion for oratorical distinction among the young declaimers of the schools. After Augustus had *pacified eloquence along with all things else*, the mature orators of the falling republic, such as Pollio and Messala, had retired with suppressed indignation from the rostra, and disdained to degrade their talent by exercising it in false and frivolous declamation.[1] But the rising generation, to whom the fresh air of liberty was unknown, had no such honourable scruples. The practice of the art in private, by which Cicero and his rivals had kept the edge of their weapons keen for the encounters of the forum, became, under the new regime, an end, and not a means. The counterfeit or shadow was adopted for the substance of oratory. The schools of the rhetoricians, who professed instruction in eloquence, were more frequented than the forum, the senate-house, and the tribunals. They became the resort, not of learners merely, but of amateur practitioners; and the verdict of the select audience they

The schools of the rhetoricians.

bant." In the next chapter the author adduces as a further cause of the decline of eloquence, the limitation of time, first imposed on the orators by Pompeius. That such a limitation, once imposed, should never have been removed again, seems to show that it must have had great practical advantages.

[1] Tacitus, *de Orator.* 38.: "Postquam longa temporum quies et continuum populi otium et assidua senatus tranquillitas et maximi principis disciplina ipsam quoque eloquentiam, sicut omnia alia, pacaverat."

entertained was more highly prized than the suffrage of the judges, or the applause of the populace. Around this new centre of exertion, traditions of its own began speedily to gather. It had its examples and authorities, its dictators and legislators, men whose maxims became axioms, and whose sayings were remembered, quoted, imitated, and pointed afresh by each succeeding generation. It had a manner and almost a language of its own. One declaimer was reproved for addressing the mixed assemblage of a public place in the style reserved for the initiated of the School[1]; another, when called upon to plead in the open air, lost his presence of mind, committed a solecism in his first sentence, and called in his dismay for the close walls, the familiar benches, and the select auditory before which alone he was fluent and self-possessed.[2]

What then was this declamation, which for the space of a hundred years from the battle of Actium was the most really active and flourishing of all intellectual exercises at Rome? We happen to possess a great collection of its remains, preserved to us by one who was perhaps the most renowned professor of the art; a man who rose in some respects superior to its trivialities, and lived to perceive its fatal tendency, and lament its degeneracy. M. Annæus Seneca, the father of the celebrated philosopher, and generally distinguished from him by the title of the Rhetorician, after giving instruction in Rome, whither he had repaired, at the close of the civil wars, from Spain, for more than half a century, was induced, in extreme old age, to put on record for his sons the wittiest and finest

M. Annæus Seneca, the rhetorician.

[1] M. Senec. præf. *Controv.* v.: "Nihil indecentius quam ubi scholasticus forum, quod non novit, imitatur."

[2] M. Senec. præf. *Controv.* iv.: "Nec ante potuisse confirmari tectum ac parietes desiderantem quam impetravit ut judicium ex foro in basilicam transferretur."

sayings of the declaimers of his own best days, which had fallen under the principate of Augustus.[1] He divides into the two classes of Suasives and Controversies the subjects of their scholastic exercises. The first are quasi-historical; as, whether Alexander should have launched on the ocean; whether Cicero should have burnt his Philippics: the second refer to debateable points in ethics or casuistry, ingeniously intricate, and perversely indeterminable; points on which the cleverest things that can be said prove only how much better it were to be silent.[2] On all these subjects the compiler has cited entirely, as he says, from memory a multitude of subtle and sparkling sentiments from the most illustrious wits of the period; while in his prefaces he marks with strong and rapid touches the literary characters of a large company of declaimers. In these pages Porcius Latro, Albucius Silo, Arellius Fuscus, Cestius, Gallio, Montanus, and many others have each their distinct individuality; and the anecdotes related of them are often piquant in themselves, as well as historically curious.[3] The fashion of epigram and antithesis,

[1] M. Seneca, or Seneca Rhetor, was a native of Corduba in Spain, and born about the close of the seventh century of the city. He came to Rome at the termination of the civil wars, and became a fashionable teacher of rhetoric. He wrote also a history of his own times, of which only two short fragments have been recovered. Towards the end of his life, which was protracted into the reign of Caius Caligula, he addressed to his three sons, Lucius Seneca, Lucius Mela, and M. Novatus, the compilation on rhetoric which is now extant. If his declaration that it is made from memory is accurate, the work is a very extraordinary one. He gives other portentous instances of his powers in this respect. See præf. *Controv.* i. The remains of Seneca Rhetor are well analysed by Egger. *Historiens d'Auguste*, ch. iv.

[2] Champagny (*Césars*, i. 212. foll.) has painted the schools of the declaimers with great force and brilliancy.

[3] Thus, for instance, it is interesting at least to learn that Ovid's fine saying, "Arma viri fortis medios mittantur in hostes," &c., was taken from a declamation of Latro. There is also an amusing story of the poet's friends asking leave to select three of his lines to be expunged, and his consenting, on condition that he might also select

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A TEXT-BOOK

ON

INDIAN AGRICULTURE

BY

991

J. MOLLISON, M.R.A.C.,
Of the Bombay Agricultural Department.

55187

VOL. III.

FIELD AND GARDEN CROPS

OF THE

BOMBAY PRESIDENCY.

LIBRARY OF THE BOMBAY BRANCH

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PREFACE.

THE fields and garden crops of the Bombay Presidency are very numerous. Only the more important of them have been dealt with in this work. The information given has been collected by the writer by personal observation in the field, from the records of the Bombay Agricultural Department, from notes kindly put at his disposal by Professor Middleton, late of the Baroda College; Mr. P. R. Mehta, M.R.A.C., of the Gujarát Revenue Survey; and by Professor Gammie, College of Science, Poona. Dr. Watt's "Dictionary of Economic Products" and Messrs. Duthie and Fuller's "Field and Garden Crops" have been freely exploited for information.

The usefulness of the work for agricultural students, district officers and others would be enhanced considerably by correct illustrations and botanical descriptions of the various plants referred to. This work the Director of the Bombay Botanical Survey has now in hand. Professor Gammie promises that such illustrations and descriptions will be available, should an extended edition of the "Bombay Field and Garden Crops" be, in the future, printed. The student has already at hand excellent illustrations in Messrs. Duthie and Fuller's "Field and Garden Crops."

The writer's present effort has been to give fairly full description of the conditions of soil and climate under which each crop is grown, with details of cultivation, outturn, etc. It is hoped that the work will, in particular, be useful to agricultural teachers, agricultural students, and district officers. It will help the latter to become easily acquainted than at present with Indian agricultural methods and facts.

The crops which have been described are grouped as under:—

(1) Cereals.
(2) Pulses.
(3) Oilseeds.
(4) Irrigated garden crop.
(5) Fibre plants.
(6) Fodder crops.
(7) Drugs, narcotics and dyes.

I am indebted to the office establishment of the Survey Commissioner and Director of Land Records and Agriculture for examination and correction of proofs and, in particular, to Mr. Yashvant Nilkanth, the Superintendent in that office.

J. M.

POONA, *January* 1901.

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BOMBAY CEREALS.

THERE are fourteen cereals in common cultivation in the Bombay Presidency. Professor Gammie, of the College of Science, Poona, describes the general characters as follows :—

The *roots* are fibrous, and the taller species are additionally supported by *adventitious roots* thrown out from the lower joints. The *stems* or *culms* are hollow or solid, and are divided into distinct *joints*. The *leaves* are alternate, usually long and tapering, longitudinally parallel-veined, and the margins are often armed with forward-pointing, minute, cutting hairs. The lower part of the leaf, which is wrapped round the stem, is the *sheath*. At the apex of the sheath, where the blade of the leaf is given off, is a small appendage, often hairy, called the *ligule*. The part bearing the flowers or *inflorescence* is terminal, forming *panicles*, *racemes* and *spikes*, and the ultimate divisions are called *spikelets*. Each spikelet consists of 3 or 4 or more scaly bracts, called *glumes*, of which the two lowest are empty ; the third and fourth and succeeding glumes, if present, are called the *flowering glumes*, and each of these, as a rule, contains a similar, but transparent, bract, called a *pale*. The actual flower of the plant is within the pale. The external organs—*perianth* of ordinary flowering plants—are represented by 2 (rarely 3 or 6) minute, fleshy scales, called *lodicules*. The *stamens* are normally 3 (rarely 1, 2 or 6) ; their stalks or *filaments* are threadlike and pendulous, and support the two-celled *anthers* by a point on their backs (*versatile*). The *pollen* is distributed in the form of a dry powder by the agency of the wind. The *pistil* is seated in the centre of the flower; its lower inflated part, which becomes the grain, is the *ovary*, containing a single *ovule* or germ which is fertilized through the two feathery, spreading *styles* which form the upper part of the pistil. The *grain* is the *fruit*, and it is generally free from the flowering glume and pale, but sometimes is adherent to them. The *embryo* or future plant is small, and is situated at the base and outside the body of the grain.

Sorghum vulgare—Pers. or *Andropogon Sorghum*—Brot.

GREAT MILLET. { *Jowár* or *Jowári* ... ... { Gujaráti. Maráthi.
Jola ... ... Kánarese.

Natural Order—*Gramineæ*.

Tribe—*Andropogoneæ*.

Habitat. It is doubtful whether *jowár* was originally a native of India. A form of sorghum was cultivated in India long before the introduction of the present cultivated form of *jowár*. Numerous varieties of the cultivated form are now grown all over India. The guinea corn of the West Indies, the dhurra of Egypt, the kaffir corn of South Africa, the broom corn of Italy, the United States and Australia are all sorghums, somewhat similar to the common *jowár* of India ; but whether the species are the same cannot be stated with certainty.

Botanical Description (Professor Gammie).

Andropogon Sorghum—Brot.

Annual, tall; *stems* thick, solid; *leaves* large and broad, smooth except near the base, midrib broad, margins rough and cutting. *Panicle* dense, ovate, erect when young, nodding before the ripening of the grain; branches and branchlets in crowded whorls. *Spikelets* in pairs, each one-flowered, the lower stalkless, hermaphrodite and producing a grain, the upper stalked, male only; *glumes* equal; *grain* white or red.

Distribution in the Bombay Presidency.

The crop occupies 7,000,000 to 8,000,000 acres annually. Its distribution is regulated by the character of the soil, as well as by the average rainfall. Where the rainfall is excessive, it gives place to rice. On the *goráda* (sandy loam) soils of Gujarát and the thin soils of the Deccan, it gives place to *bájri*. Elsewhere in the Presidency, except, perhaps, in the Panch Maháls, where maize in the staple, and in certain localities favourable for wheat, it is the most important food-grain crop. In the Konkan, on account of the heavy rainfall, it occupies a very small area. In the Deccan, Sholápur grows nearly 1,500,000 acres, Násik about 1,000,000, and other collectorates from 500,000 to 800,000 acres each. In the Karnátak, Bijápur grows 1,800,000 acres, Belgaum 750,000 acres and Dhárwár about 600,000 acres. In Gujarát, Ahmedabad returns 350,000, Kaira 70,000, Panch Maháls about 5,000, Broach 100,000, and Surat 118,000 acres. These figures are, to some extent, misleading because it is the general practice to grow *jowári* and nearly all cereals with a subordinate pulse mixture. The proportion of mixture can only be estimated, and the exact areas under different crops only approximated.

Season. Soils.

Jowár is the staple grain crop where black or mixed black soils predominate, provided the rainfall is moderate and well distributed. The rainfall for *kharif jowár* should not exceed 40 to 45 inches, and in the best districts is ordinarily from 30 to 35 inches. *Rabi jowár* is extensively grown in the Presidency, and the success of this crop depends upon two conditions—(*a*) upon a soil that is dense enough and deep enough to retain moisture, (*b*) upon sufficient late rainfall. The September and October rainfalls are specially important to *rabi jowár*, and if there is a moderate rainfall in November or December also, the success of this crop is assured. The best *kharif jowár* is, perhaps, grown on black soil and in rotation with cotton, but the crop does particularly well also on the deep, alluvial soils of Gujarát, especially on *besar* soils which are clay loams. The best rabi crops of *jowár* are probably grown in Broach on very deep, black soil which is so dense and deep that it gets sodden during the monsoon rainfall, and therefore is unsuitable for *kharif jowár*. It is, however, so retentive of moisture that such rain as falls after October is usually of immaterial importance to the *rabi* crop.

Mixtures.

Various pulses, oilseeds and fibre crops are generally grown with *kharif jowár*. In Gujarát there is a greater variety than elsewhere. There, subordinate to *jowár*, we find *tuver, guvár, math, mag, cholá, adad* (all pulses), castors and *tal* (oilseeds), and *ambádi* and *rozi* cotton (fibre plants). The group of subordinate crops referred to are not often sown all together, but mixed

according to the fancy or inclination of the cultivator. In Khándesh, *udid* and *ambádi* are ordinarily sown with *jowár*. In the black soil of Surat, *tuver* is always subordinate to *jowár*, and generally also *mag*. In the Deccan, on mixed black soil, *tur*, *ambádi*, *udid*, and sesamum and on distinctly light soil, *math*, *kulthi* and sometimes niger-seed are generally subordinate to *jowár*.

Rabi jowár in Broach is generally sown alone. If sown earlier than usual on account of favourable September rain, there may be a sprinkling of *tuver* and sesamum and also *chibdi*. The latter is a small cucumber which, with sufficient moisture in the soil, spreads its trailing stems during December and January through the stalks of *jowár*, and yields bountifully. *Rabi jowár* in the Deccan and in parts of the Southern Marátha Country has usually subordinate to it rows of safflower (*kardai*). This oilseed generally also occupies the headlands, because its leaves are prickly, and stray cattle are not inclined to pass through it to the principal crop. A sprinkling of linseed is occasionally sown with *rabi jowár* or this oilseed may occupy separate rows.

Cultivation of Kharif Jowár in the Deccan.

The land should be ready for sowing by the end of June at latest. Preparatory tillage generally begins in the hot weather. The heavy bladed harrow (*vakhar*) is then worked. This implement is generally weighted down with a stone, or the driver stands on the head piece, so that the penetrative power of the blade is increased. It scrapes or scarifies the surface, uproots the stubble of the previous crop, and forms a thin layer of loose soil which, when sufficiently moistened by monsoon rain, provides a favourable seed bed. Annual weeds spring up early in June after the soil has been well soaked with rain. They can easily be destroyed if the *vakhar* is worked two or three times before sowing. This working tends to deepen the tilth. At the same time the firm seed bed which *jowár* likes is preserved. A firm seed bed is important, because, if the crop is sown on loose soil, there is considerable risk of "lodging" by rain or wind. *Jowári*, in rotation with cotton on black soil, is rarely manured. Any manure that is available from time to time is given to the cotton. In some parts of the Deccan *jowár*, with a subordinate pulse mixture, is taken year after year on the same land. In this case manure is occasionally given, and should always be applied in a thoroughly decayed condition in the hot weather.

The subsequent tillage mixes it properly with the soil. *Jowár* responds quickly to the action of manure. The effect of a liberal application of old farmyard manure becomes clearly manifest, especially in a year of favourable rainfall.

The seed rate for *jowári* varies. Some varieties which under favourable conditions of cultivation have large heads of grain require a smaller seed rate than other varieties having smaller heads of grain. It is always safe to sow more seed than is actually needed to provide a full plant. The risks of failure of the first sowing is thus minimized. Heavy downpours of rain may destroy many young plants. These are delicate when young, but are not easily hurt after they are 4″ to 6″ high. It is a simple matter to remove superfluous seedlings,

The seed rate and the conditions which regulate it.

whereas, if there are many vacancies, the field may have to be resown. Late sown *kharif jowâr* in average seasons rarely produces a satisfactory crop. There are other conditions which should determine the seed rate. The straw or stalks known as *kadab* in Gujarát and *kadbi* or *karbi* in the Deccan provides the chief fodder for cattle in the cold and hot weather. Near populous centres this fodder commands a higher price than in out districts. Where a good market for *karbi* exists, there the seed is thickly sown. A thick crop and fine tnin stalks are thus produced. The *karbi* is, therefore, excellent in quality. The cultivator by thick sowing gets a larger yield of fodder, but a reduced outturn of grain. The gross outturn is, however, worth more than from a crop specially grown for grain. The ordinary seed rate for a grain crop is 6 to 8 lbs. per acre, along with 1½ to 2½ lbs. of subordinate pulse, etc., mixture. These seeds are generally mixed before sowing, and are sown with a 4-coultered drill. The distance between the rows is generally about 14". The surface should be levelled after sowing with the head piece of the *vakhar,* the prongs and blade being removed. As a rule, on well prepared land, *jowâri* only requires one hand weeding. A thriving crop soon shades the ground, and weeds are more or less suppressed. Still the *jowâr* seedlings are so small and delicate when they first spring up that weeds, if unchecked, soon make greater progress than the crop with disastrous result. Timely hand weeding once or oftener is, therefore, necessary. Bullock hoeing is of equal importance, not so much because weeds are thereby destroyed, but because the surface soil dries and cakes after heavy rain, and stirring is then very beneficial. The *kolpa* (the only bullock hoe used in the Deccan) should be used at least three times at intervals of a fortnight. The first hoeing should be given after hand weeding and about three weeks or a month after sowing. *Kharif jowâr* comes into flower in August and September in the Deccan, and is ripe in October and November. The pulses are usually reaped previously. *Udid* ripens earlier than other pulses. *Math* on moderately light land may ripen after the *jowâr*. The pods of *chavli* and *mug* are usually plucked before they are ripe, and used as green vegetable. *Ambâdi* usually is left standing in the field after the *jowâr* is ripe.

Watching.

Birds are very destructive to *jowâr* and some other crops. They begin their depredations when the ears begin to fill. Fields have to be watched from daylight to sunset for a month or six weeks before harvest. A large field can only be effectively watched by several watchers; hired labourers are of very little good for this work. The owner of a field and members of his family standing on raised platforms placed in the crop do their utmost to scare birds away by slinging stones or hard lumps of earth and producing a hideous din by beating old kerosine oil tins and in other ways which are likewise productive of much noise.

Harvesting.

The method of harvesting depends greatly upon the character of the crop. If the stalks are coarse and tall, they are cut with a sickle. A stubble of considerable length is left. If the crop is thick and the stalks fine, the plants are partially reaped, partially uprooted with a blunt sickle, and shaken, as far as possible, free of adhering earth. They are laid evenly in swathe. Coarse stalks from a thin crop are laid neatly in bundles. The heads of grain, after exposure to the sun for three or four days, are cut off by women, and carted to the threshing floor. Men then bind the stalks (*karbi*) into sheaves (*pendhis*), and these, when dry, should be carefully stacked.

A curious method of storing *karbi* in the Southern Marátha Country.

A curious method of storing the *karbi* prevails in the Southern Marátha Country. The bundles are built into neat oblong heaps in the field. Each heap is built with a slope from the ground to the ridge, and, when complete, is protected along the sides, ends and top with big lumps of black soil, which are built or packed closely together. These heaps, when complete, look like large boundary marks. Cattle can freely graze over the stubble, but can get no access to the stored fodder.

Threshing.

The threshing of *jowŭr* is usually done in the ordinary way under the feet of bullocks. A stout pole is placed upright in the ground in the middle of the threshing floor. A good threshing floor can be made on black soil. The floor is prepared by puddling with water and by driving a pair of bullocks yoked to a cart round and round until the puddled surface gets smooth and indurated. The surface is finally smeared with a plaster made of earth, cowdung and water. One bullock is so tied to the central post that he can walk freely round it and not entangle the tying rope. Other bullocks are ranged alongside the first bullock and tied each neck to neck. They can in this manner be driven round more or less in line. The heads of grain are usually alone threshed, not the stalks. The heads of grain are put on the threshing floor about 6″ deep. In the case of a crop with short, thin stalks, straw and grain may be trampled together; the depth should then be about a foot. As the treading proceeds, the mass should be raked up or turned over to facilitate the work. The treading out of corn is in the Deccan distressingly hard work for the cattle, because they are tied together in such a cramped or confined manner. Gujarát cultivators manage the work much better. Two or three bullocks are driven by one man by means of ordinary reins. The cattle walk round at a quick pace and with freedom. Sometimes the bullocks are driven yoked to a cart. The pressure of the wheels helps to separate the grain. The question may be seriously asked whether these old-time methods are not now antiquated. Under the existing conditions of Indian agriculture, I am afraid they are not. One can, of course, point to the speedier, cleaner work of steam threshers and winnowers in more advanced countries, but one also should remember that the flail for threshnig and the hand riddle for cleaning and sifting were in these countries very much in evidence not so many years ago. They did good work in the hands of expert labourers. The ordinary field labourer in India is also expert at threshing and winnowing in his own way. The hard up cultivators of small holdings cannot afford to change their methods. Such threshing and winnowing machines as have been introduced into India have not kept in effective working order long. Owing to the excessive heat, the wooden parts warp, and the iron parts get out of proper bearing.

In Madras, especially in the Bellary District, ordinary stone road rollers are used for threshing *jowár*, and do effective work.

In Gujarát wheat is threshed with a machine, the action of which is, to some extent, similar. The wheat thresher of Gujarát consists of a series of iron toothed discs, keyed on three spindles which are fixed like axles in a frame. The discs are so placed on the spindles that no two follow in the same track. A man sitting on a seat above the frame drives two

bullocks, which drag the thresher round the grain pile. The discs act as wheels to the thresher, and, in revolving, thresh out the grain, and at work not only do so, but bruise or cut up the straw into *bhusa*. The stone roller, on the other hand, is used merely to crush out the grain from the heads of *jowári*. At first sight, it would appear that the weight of the roller would damage the grain, but such is not the case. This method of threshing, doubtless, has its advantages in economizing bullock labour at a season when it could be economically employed in ploughing fields which have become infested with *kunda* and other deep-rooted weeds. Such ploughing to be effective must be done in the fair season and preferably at that season when the work cattle are usually employed at that long, tedious operation—"treading out the corn."

Winnowing.

Hot winds begin to blow in the Deccan in March, and then grain is mostly prepared for market. A steady wind of fair strength is best for winnowing. The threshed grain and chaff are carried by means of a *sup* or basket to a man who stands on a stool, and who allows the grain and chaff to drop in a steady stream from a height of 8 feet (from a lower height, if the wind is strong). The grain with earth particles drop straight down. Dust, chaff and all light materials are carried some distance by the wind. A man or woman sitting under the stool (*chakur*) gives the grain a finishing touch by brushing away such impurities as can be separated by means of a broom made from the culms of a grass called *bokhri*. A broom made from thin stalks of *tur* or cotton does equally well for the purpose.

Outturn.

An average crop in the Deccan will vary, according to the quality of soil, from 500 to 900 lbs. per acre of *jowár* and 100 to 200 lbs., subordinate pulses with 350 to 450 bundles of *kadbi*.

The *kadbi* is invariably sold by the 100 bundles. By custom 106 bundles are counted as 100. The price is regulated, to some extent, by the size of the bundles, by the quality of the *kadbi*, and the season when sold. A small bundle weighs about 3 lbs., a large bundle 7 or 8 lbs.

Cultivation of Kharif Jowa'r in Gujara't.

The cultivation of *kharif jowár* in the Surat District may be taken as illustrative of its cultivation in many other parts of the Presidency. There, on black soil, it generally alternates with cotton. The cotton stalks are removed, and the land repeatedly harrowed or scarified in April and May. If the land is fairly clean, no ploughing is required, because *jowári* likes a firm seed bed. On the *goráddu* or sandy soil of Northern Gujarát ploughing is necessary, not so on black land. If the land is weedy, two light ploughings are given when the soil is moist after rain. A favourable seed bed is prepared by the subsequent use of the harrow.

In June or early July the seed is drilled in rows about 20 inches apart. The light two-coultered drill, with coulters set 28 digits apart, is used. The seed rate depends upon the proportion of subordinate pulse mixture (*kathol*) sown. Ordinarily the following figures will represent seed rate, and produce, under average circumstances, on good black land :—

	Seed per acre. Lbs.	Produce per acre. Lbs.
Jowâri	6	700—900
Tuver	2	150—200
Chola	½	Eaten as green vegetables.
Mag	1	60—80
Ambâdi (Sheria)	Sprinkling.	Fibre for ropes.
Tal	¼	40—60

After the drill, a light harrow follows to cover the seed and level the surface. Sometimes the *samâr* (plank roller) is used for the latter purpose. When the crop stands about 9 inches high, the bullock hoe is used for inter-culture, and immediately afterwards the crop is hand weeded. Superfluous seedlings are removed by hand. Ten days afterwards the bullock hoe is again used, and, if necessary, another hand weeding given. Subsequently, the plough is passed between the rows. This breaks up the surface into rather rough lumps, and tends to conserve moisture in the soil. No further attention, except watching, is required until the crop is ripe. The principal crop is ready about five months after sowing. It is reaped with a sickle, and usually a long stubble is left. The stalks are laid neatly into bundles. These are bound up three or four days afterwards, when the heads are removed and carted to the threshing floor. The bundles (*pullas*) are stacked when quite dry. 350 to 450 bundles of *kadbi* are usually got from an acre.

Cultivation of Rabi Jowa'r in Gujara't.

In the Broach District, north of the Nerbudda, *rabi jowâr* is extensively grown. There the black soil is deeper than that of Surat, and although the rainfall of Broach is not particurlaly heavy, the depth and density of the soil retains sufficient moisture to favour the growth of *rabi jowâr*.

In Broach, *shiâlu jowâr* is drilled in September or October. The preparatory tillage is one or two ploughings and repeated harrowings. The seed rate is 7 or 8 lbs. per acre. The rows are about 20 inches apart. The drill used is the heavy two-rowed drill, with coulters 28 digits apart, which leaves the surface soil in rounded ridges and shallow furrows. The rows of crop occupy the furrows; this is an obvious advantage. Sufficient moisture is thus got to secure germination without burying the seed too deeply, and the practice might well be imitated elsewhere. The crop is twice inter-cultured with the bullock hoe, once before and once after the *samâr* is used upon it. The *samâr* is worked across the rows, and the object in using this leveller is to fill up the cracks in the soil. As the ears begin to fill, the stalks are tied up to each other, so that they may not be lodged. This is only necessary in a good year with a good crop. Harvest usually comes in February or March, five and a half or six months after sowing. The ears are first cut off the standing crop, and then after a few days the stalks are pulled by the roots. The stems are ordinarily 4 to 6 feet high. An acre produces 800 lbs. to 1,000 lbs. grain and 300 to 400 bundles of *kadbi*, each bundle weighing 4 to 6 lbs. The fodder is usually of excellent quality, because the crop stands fairly thick upon the ground and the stalks are neither very tall nor very coarse. A *rabi* crop in other black soil districts yields generally in a fair season 550 lbs. to 700 lbs. per acre.

Diseases and remedies.

Jowári is subject to several diseases. When young, it is attacked by aphides (*mowa*). It is subject to rust—not, however, the true wheat rust. The fodder is thereby deteriorated, but it is doubtful if the outturn of grain is much lessened. Aphides and rust appear when there is continued cloudy wet weather and in ordinary seasons. With a fair proportion of sunshine, little or no injury is done by these attacks. A fungoid disease allied to both smut and bunt, without the greasy appearance and smell of the latter, is common in both *jowár* and *bájri*. It is called *angaria* in Gujarát. This disease and other fungoid diseases owe their origin in part to diseased germs which contaminate the seed. The germs can be destroyed by steeping the seed before sowing in sulphate of copper (½ per cent. solution) or in water at a temperature of 135° to 150° F. The hot water treatment is the simplest, but not so effective as the sulphate of copper. Boiling water and well water at any ordinary temperature, if mixed together in equal proportions, will give water sufficiently hot, but not too hot, for the purpose. The temperature will ordinarily range from 135° to 145° F. The results noted below were obtained at the Surat Farm in 1898-99—a bad year for smut in *jowári*. They show unmistakably the value of steeping seed before sowing.

	Number of smutted ears per acre. Unsteeped plot.		Number of smutted ears per acre. Seed steeped in ½ per cent. copper sulp. solution.		Number of smutted ears per acre. Seed steeped in hot water.	
1898-99 ...	1st plot.	2nd plot.	1st plot.	2nd plot.	1st plot.	2nd plot.
	No.	No.	No.	No.	No.	No.
Smutted ears...	200	329	23	18	61	59

Stale urine is sometimes used as a preventative for this fungoid disease. It should be poured over the grain, and powdered quicklime afterwards used for drying.

The sugar borer (*gabra*) is often destructive in *jowári* fields. As far as is known, the life history of this pest is given in the account of sugarcane cultivation, as well as the remedies. *Jowári* affected with *gabra* is supposed to contain a poisonous principle not well understood. It is known that young shoots of *jowári* and young plants which have withered prematurely owing to drought are dangerous if used as food for farm animals.

A vegetable parasite (*tavli*), *Striga hirsuta*, attacks sugarcane and *jowári*. Its fibrous roots entwine round the roots of the crops named, and check their growth. The crops become pale and patchy in appearance where *tavli* occurs. The parasite grows rapidly, and frequent weeding is the only remedy. (*See* description under Sugarcane.)

General Characteristics of Jowá'rí.

Large number of varieties cultivated.

Over one hundred and twenty distinct varieties of *jowár* have been identified throughout the Presidency. All have been grown side by side on the Government farms. Detailed descriptions of each variety have been taken, but it will take years of patient investigation to determine accurately the true economic value of each variety. The number of varieties in general cultivation throughout India is probably very large.

Kharif and *rabi* varieties.

The most noticeable differences between varieties are that *kharif*, *i. e.*, rain crop or early varieties are much more numerous than *rabi* or late varieties. Early and late varieties do best if sown at their appropriate seasons. A *rabi* variety may or may not thrive if sown as a rain crop. None of the rain crop varieties are likely to succeed if sown in the *rabi* season.

Development varies with season, soil, etc.

The development of the plant as regards length and stoutness of stalk and size and weight of grain head depends more upon the character of the season, the kind and condition of soil, and the methods of cultivation than upon differences between varieties.

Thick and thin sowing.

If the seed of any variety is sown thickly in good, well manured soil in a favourable season, the stalks will grow tall and thin, and produce small heads of grain. It cannot, therefore, be said that any variety grows to a particular height and produces heads of grain of a particular weight and size. There are, however, other characteristics that are perfectly constant.

Tillering.

None of the varieties examined have any decided tendency to produce more than one shoot from one root. Numerous shoots from one root indicate a check in the early stages of growth or a diseased condition. Thus if the leading shoot is attacked by the sugar borer, several side shoots will grow. In some varieties a much more vigorous growth springs from the stubble of a reaped crop than in others.

Heads of grain.

Genreally, each single stalk produces one head of grain; but in some varieties the principal stalks have side-shoots which each produces a head of grain which is smaller, and ripens later than that on the main stalk. Supposing the plants of each variety stand sufficiently far apart for natural and full development, then the heads of grain in some varieties are very much larger and heavier than in others. The natural weight of heads of grain may range from 2 oz. or less to 1 lb. or more.

The heads of grain in different varieties vary in shape and general construction in remarkable degrees. They may be dense and hard, or more or less open and loose, the extreme limit in this respect being a very hard, densely packed, conical head and a much branched, drooping, graceful pannicle. The peduncle which carries the grain head may be upright or bent or drooping. It may be short, of medium length, or long. A heavy head of grain has generally a drooping peduncle, and is supported on a short or moderately short stalk which is coarse and fibrous, and has usually aereal roots which give support when they attach themselves to the soil. A variety with a small head of grain or a much branched pannicle has usually a thin stalk and straight peduncle.

The fodder.

There is no doubt that the stalks of some varieties are, when ripe, far more nutritious than the stalks of others. In gauging the value of the stalks as fodder, count should be taken of the length and fineness of stalk, sweetness, freedom from coarse fibre, number of side leaves, and whether such remain green as the plant approaches maturity or wither up much earlier. As regards all these points there are considerable differences between varieties, and

it will take a good deal of careful enquiry to determine definitely which are the best grain and best fodder varieties for various descriptions of soil and climate.

Early and late varieties.

Some varieties mature much more quickly than others. It is important to know which varieties reach maturity earliest, because, after a period of scarcity or famine, varieties which produce grain and fodder in the least time would be most in demand.

The grain or seed.

There is great variation in the grain of different varieties in colour, size, shape and weight.

The best grain varieties have white or creamy white grain (excepting the apex or point which in all varieties is dark in colour). In fine varieties the grain has often a pearly lustre. It should be plump and rounded. In a very good sample 220 to 230 grains will weigh a *tola*. The range between good and inferior varieties in this respect is from 220 to over 1,000 grains per tola. In all varieties the grain is more or less flattened near the apex on one side, but in some varieties the flattening is considerable. This gives a hooked appearance to the apex. Again, in some varieties the grain is curiously indented. Such varieties are those most in request for parching, unripe ears being thus cooked.

In many varieties the grain, though of definite general colour, is bloched or spotted with red or brown spots in a very irregular manner. In a few varieties the colour of the grain can only be described as dirty.

Grain may vary in colour from pure white through all the shades of yellow and mahogany red to a dull amber or brown.

Glumes.

The glumes in some varieties are not well developed, and the grain is insecurely enclosed. In other varieties they are much more prominent, whilst in a few they completely enclose the grain and adhere to it.

The colour of the glumes may vary from pale straw through kháki and drab, red and red brown to dark brown and black. The glumes may be shining or flossy. Small awns may be abundantly present or the reverse. Some glumes have a feathery appearance.

Varieties suitable for irrigation.

Only a very few varieties of *jowâri* are suitable for cultivation under irrigation, particularly if sown late in the cold season or during the hot weather.

Green Fodder.

All varieties yield the best fodder when the plant is in full flower or when the grain has begun to form. It is probably safest to cut the crop for green fodder at the latter stage, because it is dangerous to feed very young *jowâri* to farm animals. The tendency of such fodder to cause typanites is well known, but there are other risks which are not so well understood. Such varieties as have heads of grain in the form of much branched pannicles afford no foothold for birds, and such crops require little or no watching. If the grain is closely encased in the glumes, this proves another safeguard.

Damge by birds.

Storing grain.

Jowâri and other grain is stored for years in the Deccan in underground pits or *pevs*. The manner of storage is fully described in the chapter on ensilage.

Cost of cultivating Jowár with Subordinate Tuver after Cotton, Surat District.

	Per acre. Rs.	a.	p.
April.—Digging and collecting cotton stalks	1	2	0
Do.—Harrowing once with *karab*	0	8	0
May.— Do. 2nd time do.	0	6	0
Do.—Collecting and burning roots of cotton	0	2	0
June.—Ploughing with light plough (*hal*)	1	3	0
Do.—Digging corners and headlands	0	3	0
Do.—Once harrowing	0	4	0
July.—Sowing by drill and covering seed	0	9	0
Cost of seed 9 lbs. *jowár* } Do. 3 lbs. *tuver* }	0	5	0
July-August.—Hand weeding	1	4	0
Do. —Thinning out plants	0	7	0
Do. —Inter-culture with bullock hoe twice	0	7	0
Nov.-Dec.—Watching—1 woman, 2½ months, 4 acres	2	0	0
Dec.—Harvesting *jowár*, tying bundles and stacking in field ...	1	4	0
Cutting and carting heads of grain to threshing floor and re-stacking bundles in field	1	2	0
Jan.—Threshing and winnowing	1	2	0
Harvesting *tuver*	0	6	0
Carting, threshing and winnowing	0	8	0
Rs. ...	13	2	0

The following would be the outturn of a crop on which the above expenditure was incurred:—

	Grain. Per acre. Lbs.		Fodder. Per acre. Lbs.
Jowár	850	*Jowár* Bhusa	270
Tuver	220	*Tuver* do.	240
		Bundles *Jowár Kadbi*	400

Sorghums as Fodder Crops.

Of the numerous varieties of *jowár* which have been identified, only a few are specially suitable for the production of fodder.

The best are *sundhia, dudhia, nilva, utávli,* two varieties of American sorghum, imphee or African sugarcane, *hundi* and *kálbondi.*

Sundhia.

The *sundhia jowári* is probably the best fodder variety in cultivation. It grows to perfection in its own district (Northern Gujarát) on the deep, alluvial, sandy or sandy loam soils, either as a rain crop or under irrigation in the hot weather. In other parts of the Presidency as a *kharif* crop it appears to thirve on almost any description of fairly good soil, with a moderate, well distributed rainfall. It grows excellently on medium black soil, but in the Deccan only does moderately as an irrigated crop either in the cold or hot seasons.

There are two varieties—*farfaria* and *amaria*—very similar in appearance. The latter has a denser head of grain with a tendency for the peduncle to curve slightly, so that the head of grain droops slightly. The stalks are somewhat stouter than those of *farfaria.* The head of grain in each case is a much branched pannicle. The side leaves are not very numerous, and often, like the stalks, are discoloured by red blotches like those caused by rust. The crop is apt to lodge in heavy rain, if sown

thickly. Both varieties grow with great rapidity under favourable conditions. The grain is inferior as a bread corn. The seed rate should be high—50 to 60 lbs. per acre—and, to secure even distribution, should be broadcasted by hand in the furrow behind a plough, the soil having been previously worked to a fine friable condition. Even distribution of seed is also secured by using a 4-coultered seed drill, first lengthwise and then across the field. The coulters should be about 12 inches apart. Two seed drills should be used simultaneously—one lengthwise, the other across, because then the field is finished more quickly, and there is less risk of the cross sowing being interrupted by rain. Large fields should be sown in sections.

A good crop when in flower should stand very dense, and be 9 feet to 11 feet high. In a crop of this sort the stalks are no thicker than strong wheat straw, and can be fed to cattle with no waste.

Dudhia.

Dudhia is a variety common in the Kaira and Baroda *gorâdu* soils. The head of grain is small and dense. In other respects *dudhia* has much the same habit of growth as the *sundhia* varieties, except that the stalks are somewhat coarser. It is usually grown mixed with *sundhia* in the Kaira and Baroda Districts.

Nilva.

Nilva is the best Deccan fodder variety for a monsoon crop. It is also grown for grain, but its chief cultivation is near populous centres where fodder of fine quality is specially valuable. It has a small, moderately dense head of grain, with dull coloured, rather inferior, seed. It does not require so high a seed rate as *sundhia*, 40 to 45 lbs. per acre being sufficient for a dense crop in fertile soil with sufficient rainfall. It does best on medium black soil. *Nilva* has more leaf growth than *sundhia*, with rather thicker stalks, but does not mature so quickly. The stalks in a dense crop are in no wise coarse, and there is no waste in feeding the fodder. If *nilva* is cut green, and a fair stubble is left, a second and third cut in the same season may be obtained if rain is favourable or irrigation is given. This is a valuable characteristic, common to some varieties of *jowâri* only. A thick sown crop does not withstand extreme wet weather or prolonged drought, as well as a thinly sown crop; but in the Deccan this variety does not yield to adverse conditions of soil, climate, etc., so easily as *sundhia* does or such other varieties as are not purely indigenous. It has by acclimatization become inured to conditions of climate often unfavourable, and therefore withstands them. *Nilva* under almost any circumstances in the Deccan will yield a greater outturn of fodder than *sundhia*, but I should value the fodder of the former at a lower rate, because the stalks are coarse and woody in slight degree.

Utávli.

Utávli is another good Deccan variety. It grows more quickly than *nilva*, and is particularly suitable for sowing midway between the *kharif* and *rabi* seasons. It does very well on moderately light soil, also on medium black; but a heavy crop need not be expected unless the soil is in good condition. As a cold weather irrigated crop, *utávli* does better than *nilva*. It requires the same seed rate as *nilva*. The stalks in a good dense crop are tall and thin but in a thin crop the stalks are thick and woody. The head of grain is a moderately open panniclc, carried generally erect. This

variety is recommended, if, for special reasons, it is necessary to sow a fodder crop in August or September.

Two American sorghums.

American sorghums.—Two American sugar sorghums were introduced by the Bombay Agricultural Department several years ago. They bear favourable comparison in the Deccan with the foregoing varieties as fodder crops. These varieties are similar in every respect, excepting that in one black and in the other yellow brown glumes enclose the seed; hence the names Collier and Amber. These sorghums grow raipdly, and do best as rain crops on medium black soil. When sown thickly, the stalks are thin. 50 lbs. seed per acre should be sown. There are numerous side leaves which keep green when the seed ripens. The grain head is a much branched, very graceful, drooping pannicle, affording, like *sundhia*, no foothold to birds—an obvious advantage. The grain, though inferior in quality, is plump and large. These sorghums are grown in America as sugar crops. They were found on trial not to answer as such in India, but the percentage of sugar which the ripe stalks contain adds to their feeding value, though sugar in quantity is not a safe food amongst breeding animals, as it tends to impair fecundity.

In a favourable season, on good, fairly deep, free working soil, well stocked with manure, the sorghums will yield as heavily as the best indigenous varieties; but with deficient rainfall, or other unfavourable condition, or on light poor soil, or as irrigated crops, they do not in the Deccan succed so well as *nilva* or *utávli*.

Imphee.

Imphee as grown on the farm may be classed as a near relative of the American sorghums, but does not yield so satisfactorily. The American sorghums and imphee, like *nilva*, if cut green, send up in favourable weather a second and third growth, the third growth being diminutive.

Hundi and *kálbondi*.

Hundi and *kálbondi* are recommended for cultivation as irrigated crops, and should be sown any time between November and February. None of the finer varieties referred to above as suitable for cultivation in the rains can be grown successfully on mixed black soil in the Deccan under irrigation. No other crops can compare with the sorghums in yielding a heavy weight of green fodder of good quality. Succulent fodder of this class is specially valuable in the hot weather for all farm animals, and *hundi* and *kálbondi* are the most suitable varieties yet found for the purpose. There is little to choose between them. They do best on medium black soil of fair depth, with *murum* 2 to 3 feet below the surface. The stalks of each are tall, but rather coarse and woody. The field must be well tilled and well manured with old, thoroughly decayed manure to give the best results. Beds 10 feet square should be formed for irrigation. The seed, about 40 lbs. per acre, should be evenly broadcasted by hand, and covered with a long-toothed wooden hand rake. If weeds appear, hand weeding is necessary. Irrigation is required every ten days in the cold weather and every eight days in the hot weather. Both these crops, if they are cut for fodder before they reach maturity, send up a second growth which is often a very good crop if a stubble of 2″ or 3″ is left. Several stalks spring from one root stock.

The method of sowing the rain crops has already been referred to.

Sowing.

The broadcast method behind a plough is certainly the best, but it is slow. A small country plough should be used. The seed sown in a furrow is covered by the soil moved by the plough in making the next furrow. The furrows should not be more than 8″ wide. The plough should work not more than 3″ deep, otherwise the seed will be buried too deeply and will not germinate. Two women sowing can keep up with one plough, working as fast as an ordinary pair of bullocks can walk. A harrow with the prongs and blade removed should be worked after the plough to level and smooth the surface. These methods of sowing thickly either by drill or broadcast behind the plough will only succeed in clean, well-tilled ground. The seed is sown so thickly that the field cannot be weeded by bullock hoe in the ordinary way, and the young plants being very close together, hand weeding with a *khurpa* (weeding hook) is difficult to do and very expensive. It is well to postpone sowing until the monsoon has somewhat advanced. The land should, however, be worked after the first fall of rains, and then left until the annual weeds germinate. One turn of the harrow in fine weather will destroy these, and then sowing may be proceeded with. *Sundhia* is in full flower and ready for cutting as fodder in 65 to 70 days after sowing, the sorghums and *utávli* in 75 days, and *nilva* in about 80 to 85 days.

The following are excellent outturn results from *nilva* and *sundhia* obtained in a favourable year on the Poona Government Farm. The crops were grown after lucerne which had been heavily manured from time to time. The soil was in excellent condition and in good tilth:—

Outturn results.

	Green Fodder. Per acre. Lbs.	Value of Outturn. Per acre. Rs.	Rate per Rupee. Lbs.
Nilva	32,548	108·8	300
Sundhia	26,766	107	250

We have repeatedly grown at the Poona Government Farm over 30,000 lbs. per acre of green fodder from *nilva* and the two American sorghums. None of the fodder varieties of *jowár* or sorghums can be grown continuously on the same land year after year. They become unhealthy if so grown. They should either be rotated with another good rotation crop, or they should be sown mixed with one or other of the various pulses. The sorghum fodder crop with subordinate rows of pulse can be grown continuously for a good many years on the same field without any harm being done. The practice on the Farm is to sow every fourth row with pulse. The pulse, as well as the sorghum, can be cut green as fodder. The best pulses for the purpose are *kulthi* on light soil, and *múg*, *cholá*, *udid* or *vál* on heavier soil. The mixed pulse and sorghum fodder is for feeding purposes superior to either fodder alone. Both *vál* and *cholá* grow very well also in the fair season under irrigation. Such crops in the farm have yielded—

Suitable rotation for fodder varieties.

Vál	Lbs.	10,260 per acre green fodder.
Cholá	„	15,240 „ „

A rain crop of sorghums and an irrigated fair weather crop of pulse would form a good rotation, and could be continued on good well manured land for several years without either crop becoming unhealthy.

BULRUSH MILLET—*BA'JRI—Pennisetum typhoideum,* sometimes called *Pennicellaria spicata*—Willd.

Natural Order—*Gramineæ.*

Tribe—*Paniceæ.*

This cereal is widely cultivated in Asia and along the northern seaboard of Africa. It is probably of African origin. It is not so generally cultivated in hot countries throughout the world as its more common companion millets of India. In England it is called spiked or bulrush millet. The latter name is given on account of the resemblance in shape of the spike of *bájri* to the head of the common bulrush. Throughout the Bombay Presidency, and generally throughout India, it is commonly known as *bájri* or *bájra.* In Madras it is called *kambu.*

Botanical Description (Professor Gammie).

Pennisetum—Rich. *Inflorescence* a large, dense, cylindric spike ; *spikelets* surrounded at the base by persistent, weak bristles.

Pennisetum typhoideum, Pers. Bulrush millet.

Vern. *Bájri.*

An erect *annual,* 3 to 8 feet high. *Stem* solid, simple or branched, often stout, leafy, upper joints smooth or woolly, lower rooting. *Leaves,* large, spreading, and drooping, with a few bulbous hairs near the base ; *sheaths* moderately loose, closely furrowed, smooth ; *ligule* of white densely packed hairs. Stalk of the inflorescence more or less woolly below the spike. *Spikes* up to a foot long and one and a half inches broad, erect ; *axis* woolly ; *spikelets* in clusters of 1 to 8 on separate stalks, which are concealed within the continuously densely packed inflorescence ; *bristles* unilateral, varying in colour, inner ones plumose, all as long as the spiklets or some longer ; *first* and *second glume* minute, *third* and *fourth* subequal, with large *pales. Grain* obovoid, white, protruding from the glume and pale.

Distribution in the Presidency.

Bájri is entirely a rain crop, and occupies the lighter descriptions of soils in all districts of moderate rainfall. Throughout the Deccan *bájri* is extensively cultivated on shallow, mixed black, red and lighter coloured stoney soils found on sloping ground, the lower lying, deeper, more fertile soils, as well as the more open black soil plains being chiefly occupied by *jowár.* In Gujarát the cultivation of *bájri* is most important in the sandy (*gorádu*) soils of Kaira and Ahmedabad. These districts grow, respectively, about 240,000 and 200,000 acres annually. Panch Mahál has 50,000, Broach 15,000, and Surat only 7,000 acres. In the two latter districts *bájri* is grown chiefly on the sandy coast belt. In the Deccan in ordinary years *jowár* and *bájri* occupy about equal areas. Ahmednagar has 1,000,000 acres ; Khándesh, Násik and Poona about 600,000 to 700,000 acres each ; Sátára 600,000 ; and Sholápur 250,000. In the Karnátak *bájri* when compared with *jowár* is not such in important crop. Bijápur in a good year grows over 300,000 acres, Belgaum 150,000 acres, and Dhárwár about 6,000 acres.

In most of the Presidency districts the *jowár* and *bájri* areas fluctuate considerably from year to year. In years of heavy, early rainfall

jowár will occupy a more extended area than when the monsoon is deficient or late. The latter conditions may not be unfavourable to *bájri*.

Climate.

Bájri does best when the climate is moderately dry and when the monsoon rain comes in light downpours and there is plenty of sunshine between showers. Heavy rain is disastrous to germinating seed or young seedlings, and later, when the crop has made some progress, it is checked in growth and turns yellow during heavy continuous rain. It is easier injuriously affected in this way than any other *kharif* cereal. If heavy rain comes as the inflorescence is in flower, the pollen is washed away, and many of the female flowers are not fertilized, and therefore the heads of grain are partially empty. In the Deccan the sowing of *bájri* is purposely delayed until the middle of July in order to avoid, as far as possible, the risks referred to above.

General characters of the plant.

On well manured or rich soil *bájri* tillers extensively. In the Deccan usually one spike is carried on each stalk, but in the fertile soils of Gujarát it is common to find several lateral shoots from one stalk, each lateral shoot bearing a small spike. The straw in Gujarát is of fairly good quality. It is readily eaten by work cattle and even by highly fed milk buffaloes. The straw of *bájri* in the Deccan from a ripe crop is considered of poor nutritive quality, and all kinds of farm animals prefer almost any other description of fodder to *bájri* straw. The inference is that the straw of the *Deshi* variety of Gujarát is better in quality than the straw of the Deccan variety.

Rotations and mixtures.

Except in parts of Khándesh, *bájri* is always a mixed crop; and as a mixed crop it may be grown on the same land continuously without any apparent exhaustion of soil or diminution of outturn if the cultivation is fairly liberal. On the other hand, it is often rotated. In the lighter soils of Khándesh it is considered a good preparation for Varádi cotton. In the sandy soils of Kaira, Ahmedabad, etc., it is rotated with *kodra*, *sundhia*, *jowár*, etc. In the light soils of the Deccan it is rotated with *jowár*, niger seed, etc.

In the Deccan the subordinate crops sown with *bájri* are separate rows of *tur* (usually every 4″ row) and a sprinkling of *udid*, *math*, *kulthi*, *ambádi*, etc., in the rows of *bájri*. Sometimes separate rows of *khurásni* take the place of those of *tur*. The most common, subordinate mixture in Gujarát is perennial, *rosi* cotton in rows and *math* as a sprinkling in the *bájri*, but two or more of the following crops may also be grown subordinate to *bájri*, *viz.*, *mag*, *cholá*, *udid*, *guvár*, sesamum and *sheria*; the *tuver* always in separate rows, the others as a sprinkling.

Five varieties of *bájri* have been identified in the Presidency. They are shortly described as under:—

Varieties.

Giant *bájri*, called Jabalpuri, and in the Kaira District, Bhávnagari indicating presumably the districts whence the variety was first obtained. This variety has coarse stalks and long thick spikes of large grain. It requires good land in good condition and a favourable season with well distributed rainfall. It gives poor results in light, unmanured soil in a poor season. In a really good

crop the best spikes are a foot or more in length. Professor Gammie says the grey, purple bristles equal or slightly exceed the spikelets in length.

Málbandro or *Madhodri.*—This straw is finer than that of *bájro*, the stalks being thinner. This probably is an offshoot from the *Deshi* variety of Gujarát. It has longer spikes and larger grain than the *Deshi*. The cultivation of this variety was confined until recently to Boriávi, a fertile village of the Kaira District. Professor Gammie says this variety differs from giant *bájri* in the grey, purple spikes being thinner and shorter and in having more membranous glumes.

Nadiád *bájri* or *Deshi* variety of Gujarát is, perhaps, more vigourous in growth than *Málbandro*, but the spikes are thinner and shorter, and are dull, light brown. The upper parts of the stem are inclined to branch. (Gammie.)

Awned *bájri.*—This variety is sparingly grown near Petlád in Gujarát and in the Ahmednagar District. The spikes have a hairy or bristly appearance after the pollen is shed. There is one bristle on each pedicle, about ½ inch in length or twice the length of the spikelets. (Gammie.) The bristles are rich, purplish-brown in colour before the crop is ripe. This gives a characteristic appearance. They become tawny or smoky-brown in the ripe crop. They are more developed in some heads of grain than in others, and, to some extent, protect the head of grain from birds. This is an obvious advantage. The straw is tall and somewhat coarse. The head of grain is long, and, owing to the bristles, look thick. The seed is smaller than that of the Gujarát varieties, but bigger than the ordinary Deccan variety. The presence of bristles may indicate a more recent advance from the wild form than other cultivated varieties, but the superior quality of the seed does not substantiate this supposition.

Deccan *bájri.*—The straw of this variety is not nearly so tall as other varieties. The spike of grain is short, thin and contains small seed. It is a hardy variety which resists unfavourable conditions better than other varieties. The straw is inferior fodder.

Cultivation of Ba'jri in Gujara't—(Sandy or Gora'du Soil in the Kaira District).

The land should be ploughed with the light *hal* two or three times after the first fall on rain, and then left for some time. The field should be again ploughed or worked with a bladed harrow shortly before sowing. This working will destroy annual weeds, and leave the soil in fine tilth for sowing. The seed should be sown between the 1st and 15th of July. Generally, sowings about the latter date are more successful than those sown earlier. The seed rate mixture for an acre may consist of the following:—

	Per acre.	
Bájri	6 lbs.	Mixed together before sowing.
Guvár	1 lb	
Math	1 lb.	
Mag	½ lb.	
Sesamum	½ lb.	
Ambádi or Sheria	½ lb.	
Tuver	1½ to 2 lbs.	Sown separately in every fourth row.

Usually not more than two pulses with sesamum and *sheria* are sown subordinate to *bájri*, in which case the pulse seed rate is higher than above, and the *bájri* seed rate is 8 lbs. per acre. The seed is drilled usually with a 3-coultered drill (*tarfin*), the rows being about 15″ apart. The *samár* (plank roller) is used after the drill to smooth the surface and properly cover the seed. As soon as the young seedlings are fairly strong and about 6″ high, the crop should be bullock hoed with the *karabdi*, and such weeds as are not destroyed by the bullock hoe should be hand weeded with the *khurpi* (weeding hook). The bullock hoe should be used a second time before the crop is 2 feet high. The *samár* (plank roller) is put sometimes over the crop about this time, the object being to check the growth of the plants and thereby encourage tillering. The final tillage operation is to pass the 3-coultered seed drill (seed bowl and seed tubes removed) between the rows. Each tine or coulter works midway between two rows, grubs up the soil, and throws up the earth about the rows of *bájri*. The light plough does the work better, but not so expeditiously. No further attention is required except watching to prevent damage by birds until harvest time. A crop which is sown early in July will be ripe early in October. *Tal* (sesamum) is generally ripe before the *bájri*. The pulses ripen later, but it is a common practice to pluck the pods of some of the pulses earlier as green vegetables. The mixed crop is in average seasons safer and more remunerative than *bájri* alone. In a year of fairly heavy rainfall the pulses (particularly *tuver* and *guvár*) will do well. In a year of light rainfall after July the *bájri* may thrive so well and grow so freely that the subordinate crops may be partially suppressed.

Harvesting and threshing.

Bájri is reaped with a sickle and close to the ground. It should be left lying in the field for several days, then bound into bundles and grain and straw stacked, or the heads of grain may be removed and carted to the threshing floor, and the bundles of *kadbi* only stacked. An idea prevails in Gujarát that *bájri* when reaped should lie two days in the sun and then be stacked. If left in a stack for a week, the sap is supposed to be carried to the heads, and the grain thereby becomes improved. Grain which has been stacked is easiest threshed. The ears of grain are removed by women using small sharp sickles. The work is slow and costly if done by hired labour. A woman can remove the heads of grain from about 70 bundles per day. In treading out the crop, the heads of grain should be heaped on the threshing floor to a depth of 9″, and frequently stirred with a rake during the threshing process.

Outturn.

The outturn of *bájri* in comparison with the subordinate mixture depends entirely upon the character of the season. In a season alike favourable for *bájri* and the subordinate mixtures, a well managed field in the Kaira District may yield as under :—

	Seed-rate. Per acre.	Outturn. Per acre. Grain, Seed or useful By-product.
	Lbs.	Lbs.
Bájri	6 to 8	900
Math	1 to 1½	120
Guvár	1	80
Sesamum	½	60
Sheria	½	Fibre.

The combined weight of *bájri* straw and pulse fodder may vary from about 3,000 lbs. per acre to 50 per cent. more.

Selection of seed for next year's crop and storing it.

It is advisable to select at harvest time the largest best filled heads of grain for seed for next year's crop. These heads should be threshed on a small, clean new threshing floor which cannot possibly harbour weevils. The seed as soon as it is threshed should be put mixed with ashes in clean, earthenware jars. The mouth of each jar should at once be plastered over with cowdung and mud. These remarks apply with equal force to the selection and storing of seed of all other crops.

Cost of cultivation in Gujarát.

	Per acre. Rs. a. p.
Manure, 10 loads per acre	5 0 0
4 ploughings with light *hal*	3 0 0
2 harrowings and 1 turn of *samár*	0 9 0
Sowing and covering seed with *samár*	0 7 0
Cost of seed (*bájri* and mixture)	0 6 0
Twice bullock-hoeing	0 7 0
Hand-weeding	1 4 0
Ploughing between rows	0 8 0
Watching—1 woman, 1½ months, 4 acres	1 8 0
Harvesting various crops; tying bundles and stacking in field ...	2 6 0
Cutting heads from *bájri*; carting to threshing floor	1 12 0
Threshing and winnowing *bájri* and subordinate crops	1 14 0
	19 1 0
Add Government assessment	7 0 0
Total ...	26 1 0

Cultivation in the Deccan.

The field is very often prepared with the heavy bladed harrow (*vakhar*) only. It is worked two or three times in April and May and again when the soil is sufficiently moistened by monsoon rain. Thus a friable, smooth seed bed, about 3″ deep, is prepared.

A good cultivator will, however, plough his field well, and give such dressing of manure as he can afford, particularly if the soil is moderately good and fairly deep. There is plenty of time for ploughing and thorough tillage, as *bájri* is rarely sown in the Deccan before the middle of July. If sown earlier heavy rain is apt to fall at flowering time, the effect is that fertilization is not properly completed, and the spikes are, when ripe, only partially filled with grain. The seed is drilled with the 4-coultered seed drill, and the rows are about 13″ apart. The crop is hand weeded on good land, but this expensive operation is not done on poor, upland, light soil fields. The bullock hoe (*kolpa*) is worked generally two or three times. The crop ripens in October. The cost of cultivation is much less in the Deccan than in Gujarát. The Deccan crop does not yield anything like the outturn got from the fertile soils of Kaira. The Deccan soils vary so much that it is impossible to give averages.

Bájri is subject to the same insect pests as *jowár* and also to rust and smut (*angaria*). These diseases are referred to under *jowár*. It is common to find in *bájri* a malformation caused by the flowers giving rise to vegetable shoots.

Diseases.

WHEAT, *Triticum.*—Linn.

Annual, tufted. *Stems* up to 3 ft. high, joints swollen, hairy. *Leaves* almost smooth, with a hairy fringe at base, up to 12 in. long; *sheaths* smooth above, often hairy beneath. *Spikelets* arranged in a two-ranked, cylindric or subquadrangular column, few flowered, compressed, stalkless and seated in notches of the axis with which they are parallel; *glumes* keeled, awned or awnless (bearded or beardless); top of ovary hairy. *Grain* grooved on the inner face, often hairy, free or adherent to the pale.

The following forms are said to be cultivated :—

1. *Triticum Spelta*, Linn. Covered grain wheat.
   Vern., *Khapli*; *jod.*
2. *Triticum vulgare*, Vill.
   Vern., *Ghau*, Gujaráti; *Gahu*, Maráthi; *Godhi*, Kánarese.
3. *Triticum pilosum*, Dalz. and Gibs., "having the calices covered with much soft tomentum" *i.e.*, velvet-chaffed wheat.
   Vern., *Bakshi*; *káli kusal*; *kahno.*
4. *Triticum monococcum*, Linn.

The foregoing description is by Professor Gammie.

The cultivation of wheat is pre-historic in the old world, and De Candolle believes that the culture of this cereal in the temperate parts of Europe, Asia and Africa is older than the most ancient known languages.

Habitat.

DISTRIBUTION THROUGHOUT THE WORLD.

This is essentially a crop of the warmer and drier parts of the temperate zone, but its limits of growth are wide, and the varieties in cultivation are so numerous that some are adapted to grow in any country outside Arctic limits. In India approximately thirty million acres are cultivated, of which Bombay claims two millions only. It is grown most extensively in Northern India and always during the cold weather. The young seedlings of the hardier varieties are not killed by frost, but frost or cold causes damage when the crop is approaching maturity. The winter wheats of England and Canada are so hardy that they are fresh and green in spring after severe winter, particularly if during winter the young plants are protected by a light covering of snow. Wheat can be grown successfully with a greater range of temperature than perhaps any other cultivated plant.

The wheat area in the Bombay Presidency varies with the season. It extends in years of favourable late rains. It contracts, if the September-October rainfall is deficient. The great wheat-producing districts are Ahmedabad (170,000 acres), Násik (320,000 acres), Khándesh (270,000

Distribution in the Bombay Presidency.

acres), Ahmednagar (250,000 acres), Bijápur (145,000 acres), Dhárwár 150,000 acres). But, as already noted, these areas vary considerably with the season.

Suitable soils.

It is extensively grown as a dry crop on deep, black, moisture holding soil. The finest dry crop lands of the Presidency are along the Tápti in Khándesh, in the plains of Kopargaon and along the Godávary in Ahmednagar. The Bijápur, Dhárwár and Ahmedabad wheat lands have each black soil, and are naturally fertile if late rains are sufficient.

Wheat, as an irrigated crop, does best on much lighter soil. Medium black soil, so common in the Deccan, is very suitable. Such land is of fair depth, and has a substratum of *murum* 2 or 3 feet below the surface. It occupies the lower levels of the valleys, is irrigable from wells or by *pát* from bunded streams, and, when well manured and carefully cultivated, grows excellent crops of wheat The irrigated wheat crops of Khándesh, Násik, Nagar, Poona, etc., are all grown in this class of land, whilst those of Ahmedbad, Kaira and Baroda Territory are grown on light alluvium loams. The irrigated crops of Gujarát are perhaps superior to those of the Deccan, but are far more liable to excessive damage by rust, and are more expensively cultivated, the cost of irrigation being high owing to great depth of wells.

Mixtures.

Dry crop wheat is either grown alone or with subordinate rows of safflower; sometimes linseed occupies the headlands. Wheat and gram mixed are grown in the Panch Mahál. Irrigated wheat is usually unmixed.

Rotations.

Dry crop wheat is grown continuously in some parts of Ahmednagar, Ahmedabad and Násik. In the cotton districts of Khándesh, Dhárwár, Broach, etc., it is rotated with cotton and *jowár*. In the deep black soil which borders the Tápti in Khándesh, it is rotated with linseed and gram. In the Panch Mahál on land brought under tillage during recent years it follows a *kharif* crop of maize, the land being double cropped annually. This is an exhaustive system of cropping which can only be practised in virgin land. Irrigated wheat is rotated with ordinary garden crops, but no definite order is followed.

Cultivation of the dry crop.

The preparatory tillage is usually careful. Wheat fields are during the rains usually uncropped; therefore, there is good opportunity for thorough working. Tillage begins usually before the rains by scarifying with a *vakhar* of the Deccan, which corresponds with the *karab* of Gujarát. If the *vakhar* is worked several times in April-May, its blade scraps the surface, uproots the stubble of the previous crop, fills the cracks with loose soil, and leaves a friable surface layer which readily soaks up the monsoon rain as it falls during June, July and August. The *vakhar* should be used once or twice a month, but only when the soil is in a suitable condition in respect of moistness. Tillage does harm when soil is wet; but if the surface is dry and crumbly, and if the bullocks at work can walk without leaving deep foot impressions, the soil should be worked as often as possible. The effect of such tillage is to leave the surface soil in a clean, thoroughly friable condition, whilst the substratum, 3 or 4 inches below the surface, retains

moisture, and, being more or less consolidated, provides the firm seed bed which wheat likes. Dry crop wheat land is not often manured. When a dressing is given, the manure should be old and thoroughly decayed. It should be applied in August or September, and mixed with the soil by a light ploughing. *San* ploughed in as a green manure provides a cheap and effective manure. If the field is well worked in the hot weather, the *san* can be sown in June-July, and ploughed in in August-September. Subsquently the soil should, as the *san* decays, be worked repeatedly with the *vakhar* in order to keep the surface soil clean and friable and at the same time provide a tolerably firm seed bed. Wheat as a dry crop should, if possible, be sown in October. It will thrive well as an irrigated crop if sown in November or early December. An irrigated crop must necessarily be manured, and a dressing of 12 to 15 loads of old manure per acre is sufficient.

Dry crop wheat is always drilled, a heavy two-coultered drill being used for the purpose. In some districts, as, for instance, in Broach, the rows are very wide apart, rarely less than 18 inches. A heavy drill, with coulters wide apart, deposits the seed deeper than a lighter drill with coulters close together, and sufficiently deep to secure moisture sufficient for regular germination. But the seed is not evenly distributed. The Khándesh method of sowing is probably preferable to that practised elsewhere. A heavy drill with two coulters, about two feet apart, is used. In the forward journey across a field two rows are sown two feet apart. In the back journey two more rows are sown, but one row is intermediate between the two rows previously sown. Thus the crop comes up in rows about a foot apart. But the rows are rather irregular in their distance from each other, because it is difficult to guide the drill accurately. The irregularity referred to is of no great importance, because wheat fields are generally so well prepared that bullock hoeing or hand weeding is rarely necessary. Little or no rain falls usually after the seed is sown, and weeds do not grow with the same freedom as during the monsoon. The seed rate for a dry crop varies considerably according to district and according to the condition of the soil. The range will ordinarily be from 40 to 55 lbs. per acre. Sometimes the crop is neither wholly dry nor wholly irrigated. If the soil moisture fails and the crop threatens to dry up or ripen prematurely, and if facilities for irrigation exist, the owner gives two or three waterings at intervals of a fortnight. The water is distributed over the field without any system of beds or regular water channels, and the first watering requires much water, the cracks and fissures in the soil gulping the water in an astounding manner.

Wheat is harvested by uprooting by hand, aided by a blunt sickle The surface soil at harvest time is dry and loose, and the plants are easily uprooted and shaken fairly free of earth particles. The harvested crop is laid neatly into bundles of sheaf size which, after exposure to the sun for a day or two, are tied (thin strips of aloe leaves make good bands), and carted to the threshing floor. Wheat may be threshed out three or four days after reaping or may be stacked and threshed out at leisure. It is usually trampled out under the feet of bullocks, and is easily winnowed by the hot winds which blow in March and April. In Gujarát winnowing is usually done by an artificial air current from a triangular cloth tied at two corners by thin ropes attached to fixed points, and swung or flapped rapidly at the third corner by a man or woman.

The chaff got by the above method of threshing and winnowing provides fairly good fodder. The treading process breaks the awns, and crushes the brittle straw and hard glumes into soft palatable "*bhusa*" which, as food for cattle, is very much improved if mixed with a fair proportion of "*bhusa*" similarly got in threshing leguminous crops.

Cultivation of irrigated wheat.

Irrigated wheat is sometimes broadcasted, sometimes drilled and occasionally sown by hand in the furrows behind the plough, the seed being covered by the soil moved in making the next furrow. If the soil is very friable to a depth of at least 3 inches the latter method of sowing is perhaps best. The seed can with care be sown with great regularity, and, by means of a hand hoe or rake, the field can, after sowing, be laid out into beds for irrigation. A plough should, before the beds are formed, be used to make straight furrows 10 ft. apart. These, when deepened by means of a hand hoe, serve as water channels for irrigation. The beds should not be more than 10 ft. square. An irrigated crop requires a higher seed rate than a dry crop. 70 or 80 lbs. per acre are ordinarily sown and in the case of spelt wheat in husk 100 lbs. After sowing, the crop requires little attention, besides regular irrigation. One or two hand weedings may be required, the whole surface soil being stirred with the *khurpa* (weeding hook) at the same time to break up the crust that forms after irrigation. On moderately retentive soil wheat need not be irrigated oftener than once a fortnight. But if the soil is light alluvium as in Northern Gujarát, the crops should be watered every eight days.

Outturn.

The outturn of grain varies much with the season. A well managed irrigated crop produces about 2,000 lbs. grain and over a ton of straw, whilst a good dry crop will not often exceed 1,000 lbs. of grain and about the same weight of straw. 600 to 650 lbs. grain per acre probably represent a full average crop in an ordinary year from deep, black soil, cultivated in the ordinary manner.

Diseases.

Rust (*Puccinia graminis*)—*gerva*, Gujaráti; *támbora*, Maráthi—often does considerable damage to the crop. It is most destructive in seasons with cold showers and cloudy weather, especially if such come as the crops approach maturity. Some varieties are less subject than others. *Khapli* or spelt wheat is rust-proof. The disease has occupied the attention of agriculturists in all parts of the world. But efforts to completely suppress it have not been successful. In Australia, by a process of selection, varieties, which are nearly rust-proof, have been obtained.

Smut is common in Indian wheat, as in all other cereals. But the disease does not appear, except to a trifling extent, if the seed before sowing is steeped for five minutes in a solution of copper sulphate which should not exceed ½ per cent. strength. After steeping, the seed should be dried in the sun.

The following is an estimate of growing dry crop wheat in Khándesh:—

Cost of Cultivation.

	Per acre. Rs.	a.	p.
Clearing stubble of previous crop	0	6	0
Harrowing three times in hot weather	0	12	0
Harrowing four times during rains	1	0	0
Manure once in three years, say, 6 loads per annum ...	3	0	0
Ploughing once	1	8	0
Drilling and covering seed	0	9	0
Cost of seed 45 lbs.	2	0	0
Harvesting, carting, threshing and winnowing a crop of 800 lbs. per acre	3	4	0
Total ...	12	7	0

Trade in Indian wheat.

A large export trade from the sea ports of Bombay, Karáchi and Calcutta is chiefly fed from the Central and North-West Provinces. Bombay, of course, supplies its small quota. Experts sort Indian wheats as hard and soft whites and hard and soft reds. The hard wheats are characterised by a flinty, translucent appearance which indicates a high percentage of gluten. The soft wheats are opaque and starchy, and are liked by millers. For native consumption glutenous wheats are more favoured than soft, starchy samples. This is fortunate, as the export trade requires soft wheat by preference. Hard wheats are shipped to the Italian and other sea ports of the Mediterranean, and are utilized in the manufacture of vermicelli, maccaroni, etc. Soft red wheats find a ready market in England. 5 per cent. refraction or impurity is allowed by the trade. Indian samples as sold by the cultivators rarely contain so much impurity, but must necessarily contain earth particles and small pebbles, because the crop is harvested by uprooting and because the means at hand for winnowing and screening are imperfect.

Milling wheat.

In the miller's estimation the valuable qualities of wheat are (1) colour, (2) strength, (3) flavour.

Colour.

Wheat varies in colour from pale yellow to dull red. White bread is most esteemed, and can only be made from white flour. In the old method of grinding wheat between stones, flour of better colour could be got from white wheat than from red, therefore white wheats were valued at considerably higher rates than the red; but, since the roller system of milling has been introduced, white flour can be got equally readily from white and red grain.

The roller system of milling is called the "gradual reduction process." The aim is to remove the bran in scalelike pieces which can readily be separated by sifting and winnowing, and leave the inner farinaceous portion in gritty fragments which can subsequently be rolled or ground into fine flour. The germ of the wheat, which is yellow and oily, must be separated. It is unnecessary to enter into details regarding the gradual reduction process in all its stages. It is sufficient to know that pure white flour may thereby be got from wheat of any colour.

This quality depends chiefly upon a large quantity of elastic gluten.

Strength.

Certain varieties of wheat contain a higher percentage of elastic gluten than others. The dough made from the flour of such varieties, when baked, rises into a larger loaf than would be got from the flour of weaker wheat. Strength does not depend upon varieties. The same variety may in one season produce fairly strong wheat, in another weak. This is particularly the case in temperate countries. In England the summer is sometimes unusually hot and dry, and in such seasons the grain is much more translucent and glutenous than in average seasons when it is dull, starchy and weak. The character known as hardness is by no means constant. In fact, hard and soft grains can be got often from the same ear. Indian wheats and wheats grown in the hotter and drier parts of Russia, America, etc., are strong. Countries with damp temperate climates, such as England and the sea board States of America, yield wheats which are weak. Indian wheats in Europe are in demand for mixing with English and other wheat, which are deficient in strength.

Flavour is best when strength is least. English wheats are better flavoured than those of any other country, partly on account of climate, but chiefly on account of the care exercised in the selection of seed. Indian wheats have a peculiar flavour which millers call "beany," *i.e.*, a taste resembling the *dâl* of any pulse. For this reason Indian wheats are mixed with English and those of other countries before being ground into flour. There is art in proper mixing, because colour, strength and flavour are never found in the highest perfection in one variety. These qualities, if present in any variety in proper degree, add to its market value. They can be developed by the effect of climate, soil, cultivation and selection of seed. Climate can hardly be controlled except that irrigation can replace deficient rainfall. Deep, stiff loams and well drained clay soils with sufficient rainfall produce grain of finer quality than lighter soils, but this remark must be modified in respect of irrigated crops. By a process of seed-selection carried on from year to year, the quality can be very much improved. In this process of selection the aim should be to get plump, large grain with a thin clear skin, a heavy weight per bushel, true to type, and with strong bright straw which will stand up well if the crop is heavy or during heavy rain-storms.

The milling qualities of typical Indian wheats were gauged by McDougall Bros., of Mark Lane, London, in 1882, with the following results:—

Milling qualities of typical Indian wheats.

		Weight per Bushel.
No. 1.	True soft white	64 lbs.
„ 2.	Superior soft red	62¾ „
„ 3.	Average hard red	60 „
„ 4.	Average hard white	61¼ „

		Flour. Per cent.	Middlings. Per cent.	Pollard. Per cent.	Bran. Per cent
No. 1.	Ground under mill stones ...	77·46	0·82	8·8	12·0
„	„ rollers ...	74·1	11·00	8·7	4·0
No. 2.	„ mill stones ...	78·0	1·68	9·8	9·4
„	„ rollers ...	75·4	7·7	13·5	5·5
No. 3.	„ mill stones ...	80·52	0·78	10·0	8·3
„	„ rollers ...	73·2	10·3	14·3	3·1
No. 4.	„ mill stones ...	79·88	0·78	13·2	8·5
„	„ rollers ...	74·2	10·3	13·8	3·0

Characteristic Appearances of Bombay Varieties.

The straw in all varieties is comparatively short. In a highly manured irrigated crop it may reach 3½ft. in height, but in ordinary irrigated crops it ranges from 2½ ft. to 3 ft. In a dry crop it is often very short, in which case the yield of grain per acre exceeds, to a considerable extent, the weight of straw. In most varieties a fully grown stalk has four nodes, rarely more or less. The nodes are dark in colour, but vary in shade according to variety. The extent of tillering varies with the variety, with the vigour of growth, and with the seed rate. The plants in a thickly sown crop do not tiller to the same extent as in a crop sown thin. Ordinarily, there are four to seven stems from one root, but in vigorous growing plants the number is much more. The straw varies in colour and brightness according to variety. The withered side leaves are generally a darker shade than the stem proper which may be bright and shining or dull. When very bright and shining, the straw is usually very light in colour, *i.e.*, pale-cream, nearly white. When dull in colour, the straw is darker, generally a dull yellow colour, tinged with brown. In one or two varieties the straw immediately below the ear is bent in a serpentine manner in two or three short curves. The glumes and awns of the ear are not usually the same colour as the straw. They are generally either lighter or darker in colour.

The grain, according to variety, may be classed into hard and soft red, hard and soft yellow, and hard and soft white; but, with one single exception, there is no variety that can be classed as soft wheat proper. There are certain red, yellow and white wheats which are unquestionably hard varieties, the grains being flinty and translucent to a high degree. On the other hand, there are red, yellow and white wheat which have in the same ear some grains hard and flinty, others only moderately translucent and on section showing a starchy appearance to a certain extent. Very few varieties have short, rounded, plump grain. In most cases the grains are long and eliptical, fairly well filled, and heavy in the case of a good variety and a good crop.

The period of growth varies between varieties, and depends also upon the date of sowing, the condition of the soil, regularity in irrigation, or in the case of a dry crop on the character of the season. A crop sown in October or early in the cold weather will take longer to mature, and probably yield better than one sown in December or later. An irrigated crop in rich soil matures slowly and yields very well. A dry crop with scanty late rainfall may be forced to maturity quickly, and the period from seed time to harvest may be only three months or less; whereas, under more favourable conditions, the period of growth will be from 3½ to 4½ months.

The ears of all Bombay varieties are awned and nearly all erect in a ripe crop. The spikelets are ranged in all cases on either side of the rachis, alternately. They may be attached at short intervals in which case the head is dense, or at longer intervals in which case it is more or less open. The spikelets in the middle of the grain may contain two, three or four grains according to variety. Those at the base or point of the grain generally contain two grains or two fully developed grains, and a third much smaller. Most varieties are "square head" in appearance.

Glumes.

In some varieties glumes are hard and shining, in others downy, or, when the down is considerable, "velvet chaffed." Hard shining glumes have often a slight degree of bloom, particularly when the main colour is brown or yellow brown. In one variety (*khapli*) the glumes securely enclose the grain. In others the grain can be separated comparatively easily. The awns on some varieties are long and securely attached to the glumes, in others shorter or less securely attached. The colour of the awns generally corresponds with that of the glumes, but there are exceptions. Thus several varieties with nearly white chaff have dark coloured awns, black or dark brown near the base and gradually shaded off to a pale drab or dirty white towards the point.

RICE, *Oryza Sativa*—Linn.

Natural Order—*Gramineæ*.

Tribe—*Oryzeæ*.

Grain or Paddy ...	*Dángar*	... Gujaráti.
	Bhát	... Maráthi.
	Bhatta	... Kánarese.
Straw	*Parál*	... Gujaráti.
	Pendha	... Maráthi.
	Bhattad hullu	... Kánarese.

Habitat.

Rice is found truly wild in marshy lands in tropical countries. Its chief wild habitat is, however, from Madras and Orissa to Bengal, Chittagong, Aracan, and possibly even to Cochin China.

Rice, *Oryza*—Linn.

Botanical description by Professor Gammie.

Spikelets in pannicles. *Glumes* 4, the *two lowest* minute, *third and fourth* sub-equal, without pales. *Stamens* 6.

Oryza sativa, Linn.

Annual, tufted, grown in water. *Leaves* many, rather rough, sheaths smooth. *Pannicle* elongate, erect at first, drooping as the grain ripens. *Spikelets* loosely arranged; *third glume* with a very long awn.

Season of growth.

Rice is grown at all seasons in different parts of India, provided there is water. The varieties are extremely numerous, and particular varieties are found, not only suitable for different seasons, but also for different soils, different systems of cultivation, and different conditions of climate and rainfall.

Dr. Watt mentions five crops a year as being grown in Bengal.

In Western India rice is chiefly a *kharif* crop, dependent mostly upon natural rainfall. In the Southern Collectorates of the Presidency, especially in Kánara, *rabi* rice which ripens in the hot weather is grown. This is called *vaingan* rice. The district gets the benefit of the North-East monsoon, and gets late rain. *Vaingan* rice is generally assisted by

irrigation and usually by channel water drawn from a nullah or from natural springs.

General distribution throughout the world.

Rice is very extensively cultivated in all the warmer parts of the world. It is essentially a crop of damp, semi-tropical or tropical countries. It thrives under great diversity of climate and culture. It grows well in dry climates or at least dry in comparison with Burmah, Bengal and the Konkan Districts of the Bombay Presidency. The finest varieties and the largest yields per acre are produced in districts where there is a moderate degree of sunshine and a damp, warm atmosphere.

India has a very extensive area, probably, on an average, considerably exceeding seventy million acres annually. The Bombay area is less than two million acres. Rice has been grown in India since the very earliest times.

Distribution in the Presidency.

The chief rice areas are below and on the Western Ghâts. The crop is especially important in the belt of low land which lies between these hills and the sea from the most southern part of the Presidency, as far north as Bulsár in the Surat Collectorate, also in the cosy below-ghát valleys, and in the artificially terraced rice beds, which are so numerous along the eastern and western slopes of the ghát range. The rainfall throughout these parts is very heavy. In some places on the hills over 200" are registered from June to October. In the coast belt the rainfall is 100" more or less in a season. In the upland plains of the Deccan and Southern Marátha Country, which stretch away from the eastern slopes of the ghâts, the rainfall rapidly declines, and at no great distance away from the hills rice gives place to millets.

In the northern tálukas of Surat, in Broach, Baroda Territory, the northern collectorates of Gujarát, and in Káthiáwár the rainfall is lighter. Therefore, in these districts on the open, fairly level tracts rice beds occupy positions specially favourable for impounding rain-water. They are not only embanked, but also in some cases dug out to improve their capacity for holding water. They have usually the additional advantage of being under a tank or other source of irrigation.

In Gujarát, Surat and Kaira grow each about 100,000 acres annually, Ahmedabad and Panch Maháls each 50,000 to 60,000 acres, and Broach 20,000 acres.

In the Deccan on an average the Násik area is about 60,000 acres, Poona 70,000, Sholápur 20,000, and Sátára 45,000 acres. In the Karnátak, Belgaum and Dhárwár grow, respectively, about 115,000 and 160,000 acres, mostly in their western hilly parts.

In the Konkan, Thána has over 300,000 acres, Kolába about 250,000 acres, Kánara about 200,000 acres, and Ratnágiri 50,000 acres.

Rotations and mixtures.

It may generally be said that rice is grown year after year on the same land without any rotation. This is certainly the case in the Konkan. In years of favourable late rainfall a second crop of *vál* or gram or castors or wheat or of mixed *vál* and castors or mixed gram and castors may be grown.

This second crop is, however, more common in the tank irrigated rice beds of northern Gujarát and elsewhere than in the Konkan rice fields which depend solely on rainfall.

In the rice lands of the southern tálukas of the Surat District, it is common to grow a crop of sugarcane once in four years or at longer intervals, and the same practice prevails in the laterite soils of Belgaum, Dhárwár, and in the above-ghát parts of Kánara. In these Belgaum and Dhárwár terraced rice beds a sprinkling of *jowár* is sown with the rice, and in years of average rainfall both crops seem to thrive. The conditions of rainfall most favourable for rice are entirely unsuitable for *jowár*, and the mixture referred to is a very unusual one. In Broach on deep, black soil and in the tálukas where the average rainfall exceeds 40 inches, rice is sown as a subordinate row crop with cotton. Elsewhere in Gujarát, where the land is not true rice land and the produce is uncertain, *kodra* and rice, with a sprinkling of *tuver*, are a common mixed crop. These fields are without embankments.

Soils.

The best soils for rice are clays or clay loams of fair depth. The substratum should be *murum* or other porous material. This secures fair natural drainage, and the soil is thereby improved for rice. The plant is naturally acquatic, yet it does not thrive in a soil in which water stagnates. The crop luxuriates in a soil through which water percolates with freedom and over which it flows slowly.

The Konkan rice soils are mostly greyish-black clays or clay loams. Those of Surat and Broach and Káthiáwár are black or brown clay. The Kaira, Ahmedabad and Panch Maháls rice beds are light coloured or light brown *besar* (clay loam) soils. Those of the Karnátak are yellow red or reddish-brown laterite clays or clay loams. Any description of soil which is moderately deep (2 to 3 feet), of fine or fairly fine consistence, and moderately pervious to moisture, is suitable for rice. In districts where the rain fails early, as in Gujarát, the important point is that the soil should retain water as long as the rice is likely to need it. Embankments are formed, and the surface of rice beds made level, so that water can be impounded and kept at a height which varies as the crop grows. At no times should more than two-thirds of the plant be immersed.

Terracing, embanking and reclaiming rice land.

In almost all rice fields the original surface required a certain amount of levelling and digging out, and the excavated soil was used in filling hollows or in forming the embankments. On and under the ghát on the gentle slopes of valleys and on the steeper slopes at the foot of the hills, rice beds have been formed in terraces with great ingenuity and at considerable cost. Where the original surface was uneven, sloping or fairly steep, the rice beds are necessarily smaller in area and more irregular in shape than in the open, more level tracts. In a particular group of terraced rice beds a stream fed by drainage of higher levels is made to distribute its water equally over all, and the surface is so levelled and the embankments so arranged that a slow stream passes over the beds in succession from higher to lower levels. The embankments are made of mud and necessarily range according to situation, from 18″ to 2½′ high, the width being proportionate to their height and the construction

being sufficiently strong to stand the pressure of water impounded in them. Such rice beds as receive the inflow of water brought by nullahs from the hills are enriched by the fine silt which is deposited from the muddy water as it flows slowly through.

A considerable extent of rice land in the Konkan has been reclaimed from the sea, principally along the course of tidal creeks. The first operation has been to form an embankment sufficiently high and strong to exclude the water of high tides. The soil from higher levels is carried in to fill up and raise the surface level inclosed by the embankments. The natural low lying position of these reclaimed rice beds is favourable for impounding rain water. The reclaimed land is, to some extent, salt for a time, and is only suitable for growing inferior varieties of "salt" rice. In time the soil becomes sweetened by cultivation, and then superior varieties can be grown.

Manuring.

Many rice fields on and under the ghâts are never manured, only the seed bed on which the seedlings for transplantation are raised. These below-ghât rice beds are "warped" year by year. The mud or silt carried by the numerous nullahs and small streams from higher levels is deposited on these rice beds, and the depth of soil is yearly increased. Moreover, the continuous slow passage of water through and over these soils has a softening effect upon the soil, causing considerable elimination of plant food from dormant ingredients. Nitrogen is the one element which might reasonably be expected to be deficient, but the yield from these unmanured rice beds is not decreasing, and there is no evidence to show that the land is becoming exhausted. Although many rice fields on and under the ghâts are not manured, the seed beds invariably are either by burning *râb* material thereon or by the direct application of manure. The *râb* practice has been fully described in a separate chapter (*see* Volume I). It is confined to districts of heavy rainfall.

In those parts where the rainfall is 50″ or less, rice seedlings are raised in nurseries which are manured heavily with ordinary manure or by folding sheep and goats. The effect of burning *râb* material on the seed bed is not so much manurial as physical. A properly prepared rice bed is lightly dug a few inches deep with a light pick, and the loosened surface broken up fine. Over this the *râb* material is laid and burnt. The ashes are mixed through the fine earth. The heat has killed seeds of weeds. The seed can be sown with the first signs of rain, and if rain holds off, artificial watering can be given to the small patch for a few days. The seedlings come up strong and vigorous, and can be transplanted early into the main field which, as the seedlings were growing, should be got ready by repeated ploughings for transplantation. A crop grown from early transplanted seedlings gets the full benefit of the monsoon rain, and this is extremely important in the case of the finer varieties which ripen late, and require much water late in the season.

The rice beds of Gujarát and those of the flat bottom lands of the Konkan and elsewhere are regularly manured, and the heavier the dressing of manure, the better the crop. Tank mud in Gujarát is a favourite application. Tank mud or ordinary manure is given at the rate of 40 loads or less per acre as can be arranged. The manure should be applied evenly over the

surface before the rains set in. In Gujarát the practice of green manuring is common. *San (Crotalaria juncia)* is sown thickly with the first fall of rain and after a single ploughing. A turn or two of the harrow covers the seed. The *san* grows to a height of 18 inches, whilst the seedlings are growing in the seed bed. Then it is trampled into the soil, as the field is puddled and made ready for transplantation by repeated ploughings. Castor cake is cheap in Gujarát—about 80 lbs. per rupee—and a top-dressing, costing Rs. 5 or less per acre, is given to supplement a light application of ordinary manure. Fish manure, costing about 80 lbs. per rupee, is similarly employed in the southern tálukas of Surat and parts of the Konkan. In Kánara and in the forest tracts of Dhárwár green leaves and green twigs of certain forest trees are used as a sort of green manure.

Seed rate and methods of sowing.

Rice is sown (1) broadcast, (2) drilled, (3) broadcasted in a seed bed and thence transplanted. Generally except in the case of salt rice grown on marshy situations reclaimed from the sea, the first method is only adopted by the worst cultivators. The second plan is very common in the western tálukas of Belgaum and Dhárwár and above the ghát in Kánara, also in unembanked fields in Gujarát. The third method is less risky and more successful than the others, and is particularly suitable for fields which are embanked and where the rainfall is over 80 inches or where deficient, late rainfall is supplemented by irrigation from tank or otherwise. Broadcasted or drilled rice requires a higher seed rate than transplanted rice. The *vaingan* (hot weather) rice of Kánara requires a seed rate of 160 to 200 lbs. per acre. Broadcasted or drilled rice requires 120 lbs. per acre, and the seed rate of the transplanted crop varies per acre from 25 or 30 lbs. to 90 or 100 lbs. The latter is the common seed rate in Surat and Broach. In no other districts of the Presidency is so much seed required. Everywhere the seed bed is thickly broadcasted. A sufficiency of seed is allowed to meet contingencies.

In the Konkan rice is sometimes artificially germinated before it is broadcasted. The object is to gain time by getting seedlings as early as possible. The seed is made damp and germinated in heaps or baskets when there are signs of approaching rain, and is sown broadcast when the first showers have moistened the soil sufficiently. This method is hazardous, except in salt rice lands which are sown when covered with water. It is better to sow in the ordinary way and irrigate by hand. The seed for "salt" rice is often broadcasted on rice beds over which water stands; the seeds sinks into the soft mud. The drilled rice of Dhárwár and Belgaum is sown with a 6-coultered drill. The coulters are about 8″ to 10″ apart.

The Bombay Varieties of Rice.

Their characteristic differences.

The varieties cultivated are very numerous. I have examined and described over sixty varieties. These can clearly be identified as different from each other. They form probably only a small proportion of the varieties grown within the Bombay Presidency, and necessarily are an exceedingly small proportion of the varieties cultivated throughout India. In examining the particular varieties referred to, it was made clear that mixed seed is commonly sown. At the same time it was made equally clear that rice cultivators have a natural knowledge of the various

varieties grown in a particular district, and know the conditions of soil, season, water, etc., which are most favourable for the growth of each variety.

Commercially, the paddy might be classed into very fine, fine, coarse and very coarse varieties; but it is very difficult to grade varieties into these classes. It is easy to state definitely that one variety is very fine, and another is very coarse, but there are very numerous gradations in quality between these two extremes.

The chief differences between varieties, which I have noticed, are detailed below.

Period of growth.

There are early, medium and late ripening varieties. The earliest in an ordinary season reaches maturity at the end of September, the latest towards the middle or end of November.

Soils and water-supply.

Some varieties, generally the late varieties, require deep, good, retentive soil with well embanked rice beds favourably situated to impound rain water or to receive irrigation when the rainfall is deficient. Other earlier ripening varieties will thrive well on thinner, poorer, less retentive soils and with inferior facilities for impounding water or for irrigation. There are numerous gradations between the two extremes. Certain coarse varieties are adapted for cultivation in salt land reclaimed from the sea, and such generally thrive best with much water in the rice beds.

Sowing or planting.

The finest varieties are usually grown from seedlings which have been transplanted from a seed bed into the field proper. Other varieties which are not so fine will thrive well if the seed is drilled and the coarser varieties are often broadcasted.

Season of growth.

The greater number of varieties are grown in the monsoon, and would not thrive if sown or planted at any other season. A few varieties are suitable for cultivation under irrigation during the cold and hot weather. This crop is known as *vaingan* rice.

Straw.

There are notable differences between varieties in the length, strength, colour, and brightness of the straw; also in tillering power. Some varieties produce more stems from one root than others. The finer varieties have not necessarily fine straw, nor the coarser varieties coarse straw. The straw of all varieties, whether it is coarse or fine, is very hollow. If the leaves and leaf sheaths are stripped off, the stalks, on account of the hollowness referred to, can be drawn between the finger and thumb and pressed into ribbon like strips. If the stalks are further examined, they will be found wrinkled longitudinally. The coarser and more hollow the stems are, the greater is the extent of wrinkles. As regards leaves and leaf sheaths, there are characteristic differences between varieties. Sometimes the leaf sheaths are very large, wrapping the stems very loosely; sometimes they are not so fully developed, and wrap the stems fairly tightly, particularly towards the top. The sheaths, like the hollow stems, are longitudinally wrinkled in a ripe crop. Apparently the hollowness of stem and the development of leaf sheath furnish air chambers which support this semi-aquatic plant in deep water. Therefore, it might be expected

that such varieties as need much water should have very hollow stems and very large leaf sheaths. This, however, does not always hold good. The straw of all varieties is weak. As a dry crop the straw would not support the head of grain. It would lodge. Tall straw may be 4½ or 5 feet high, short straw about 3 feet, sometimes less. The straw may be bright and light coloured or dark and dull coloured, varying in colour from pale yellow to dull yellow, tinged with brown. The sheaths and leaves are not usually the same colour as the stems. They are darker generally.

Head of grain.

The head of grain may be a large, drooping panicle or an erect small one or take many intermediate forms.

Grain (paddy).

There are very extensive differences between varieties in the size, shape and colour of the paddy. It may generally be stated that the majority of the finer varieties have long thin grains, sharp pointed, and slightly bent and triangular or somewhat three cornered on cross section. The colour is generally pale yellow or golden yellow with perhaps faint traces of brown, and the husk is not deeply grooved longitudinally; the husk may or may not be flossy. The rice or husked grain of fine varieties is generally pearly white, very translucent, flinty when broken, long and not thick. The very finest varieties give fragant or scented rice.

The finest varieties weigh from 900 to 1,400 grains of paddy per *tola*, and range chiefly from 1,050 to 1,300.

The coarser varieties can generally be easily identified by the grain. The majority of coarse varieties have large, full bodied paddy, deeply scored on the husk, and these scores appear to a less extent on the rice. The colour may be yellow or yellow with longitudinal scores of reddish brown or reddish brown with longitudinal scores of yellow or nearly entirely reddish brown or purplish black or dirty grey or drab. In coarse varieties there is generally a conspicuous extent of floss on the husk. Often there are awns. The rice or husked paddy may be white, creamy white, pale brown, bright reddish brown or deep reddish brown. Coarse rice is not usually very pearly, and is generally opaque. The rice is always plump and generally not long. It is soft when bitten, not flinty.

The weight of paddy grains per *tola* in coarse varieties may range from 320 to 900, but usually ranges from 500 to 600 per *tola*.

The general descriptions given as applicable to fine varieties and coarse varieties are not applicable in every case. For instance, there is a particular kind of rice grown extensively in the Presidency (of which there are at least three varieties), which are commercially classed as of the finest quality which have some characters common to fine varieties and some common to coarse. I refer to the varieties known as *ambámohor* and *bodka*. The paddy is deeply grooved, short and plump. The *ambámohor* has a colour generally found in coarse varieties, and it is awned. The rice (husked paddy) is white, opaque and soft, but it is fragrant or scented, and commands a high market rate.

Cultivation in the Konkan.

The seed beds should be hand dug and then *rábed*. The *ráb* material is burnt in March or April. The ashes should be mixed with the soil by light digging, and the seed sown about the end of May and

covered carefully by a long handle rake. Hand digging before the burning of the *ráb* is better than ploughing afterwards. The heat penetrates the loosened soil better. In tracts of heavy rainfall the burning of *ráb* materials before the rains is a much better preparation than the direct application of manure. The probable explanation of this is that ordinary manure, if kept excessively wet, undergoes no chemical changes by which useful plant food would be liberated. Therefore, in the Konkan, with its excessive rainfall, manure for a rice seed bed would be of very little use unless applied when very old and thoroughly decayed. Under average conditions, 6 to 8 lbs. of seed should be broadcasted on each *guntha* ($\frac{1}{40}$ acre) of seed bed, and from 4 to 8 *gunthas* of seed bed are required per acre of plantation. $5\frac{1}{2}$ *gunthas* of seed bed per acre of transplantation may be taken as average.

In a well *rábed* seed bed few, if any, weeds appear. The seed bed should, however, be carefully weeded. The seedlings, if they grow unchecked, are ready for transplanting in 25 to 30 days. They should then be 8″ to 10″ high. The cultivation of the general area begins when the soil is well soaked, and should be complete by the time the seedlings are ready. The field is made ready for transplanting by repeated ploughings with a light plough usually drawn by buffaloes. It is puddled into thin mud. The stubble and weeds and remnants of previous vegetation disappear in the mud during the process of tillage. The embankments need repairs annually.

Transplanting.

In removing the seedlings from the nursery, care is taken not to damage the plants or harm the roots. Water is allowed to stand on the seed bed, so that the seedlings are easily uprooted. In this water the roots of the seedlings are washed free of adhering earth. Two handfuls of seedlings are tied into a neat bundle. The bundles are carried to the field, and are distributed near the planters. They float on the water which stands about 6″ deep over the mud as the field is planted.

The seedlings are planted by women by hand, the root ends being simply forced into the soft mud. Two to six seedlings are planted together at intervals of 6″ to 8″. If the seedlings are strong and vigorous, two or three in one place are sufficient. The regularity and deftness with which the work is done is astonishing. For uprooting seedlings, carrying to field and planting, 12 to 15 men and women are required per acre per day. The work is usually done in pouring rain, and men and women are each protected by a simply constructed hood (*virle*), made of light wood and overlapping leaves, bound securely and so shaped that it covers the head and back. Immediately after planting, the seedlings stand in water with their tops just above it. In a week the seedlings will have rooted, the water is partially withdrawn, and dead plants are removed and replaced. Subsequently, the crop should stand in water with one-third of the plant always above it. The water should be drained off occasionally for weeding; but when there is sufficiency of water, little weeding is required. The water is finally drawn off (if the field has not already dried up) about ten days before the crop is ripe.

Harvesting and threshing.

The field should be comparatively dry when the crop is harvested. Early varieties are ready in October, the late varieties in November. Reaping is done with a sickle and close to the ground. The cut crop is laid in open bundles of

sheaf size, and these should be exposed to the sun for a few days. If there is risk of rain, the crop is bundled, stacked and protected by thatch near the threshing floor as expeditiously as possible. The grain may be threshed by treading out in the ordinary way, but the common plan is to thresh the grain when the sun has dried the cut crop sufficiently. The grain is nearly all easily separated by beating small untied bundles on a board. A large cloth is spread anywhere in the field or on the threshing floor. On this cloth a board about 2′ × 3′ is placed. The edge of the board on one side is supported on a thick, short log. The man who threshes the crop sits or stands or kneels on this side. He beats a small bundle at a time. A few vigorous strokes separate the grain. The straw is tied up as it is threshed into neat bundles and stacked. Paddy threshed in this way should not be stored in bulk until it is well sun dried.

Yield per acre.

The yield in different districts and from different varieties varies considerably. A full yield of paddy under the most favourable circumstances will be less than 4,000 lbs. per acre. A full average under favourable conditions of rainfall, etc., from a transplanted crop would be 2,800 to 3,200 lbs. per acre of grain. Broadcasted and drilled rice yield much less. A full crop would be 1,800 lbs. paddy or less.

Rice straw varies in outturn with the variety. Coarse varieties have long, rank, inferior straw. Two tons of straw per acre are often obtained. The straw is of low, nutritive value. A good deal of grass is usually obtainable in rice tracts. The straw, when threshed on a board as described, makes excellent thatch.

The following is an estimate of the cost of cultivating an acre of transplanted rice where *rábing* the seed bed with cowdung, etc., is practised :—

Cost of Cultivation in the Konkan.

	Per *guntha*. Rs. a. p.	Per acre. Rs. a. p.
Cost of preparing seed bed, arranging and burning *ráb*, hand digging, levelling, sowing seed and covering	5 0 0	
Seed 6 lbs. (32 lbs. per rupee)	0 3 0	
Total ...	5 3 0	
5½ *gunthas* seed bed for one acre of transplantation		37 11 0
Repairing embankments		0 8 0
Ploughing and puddling field		4 0 0
Cost of lifting seedlings, carrying to field and transplanting		2 8 0
Hand weeding and replacing dead seedlings ...		1 4 0
Reaping, bundling, carrying, and stacking ...		3 8 0
Threshing and winnowing at 2 annas per 100 lbs. paddy		3 8 0
Total Cost of Cultivation per acre ...		52 15 0
Estimated outturn grain 2,700 lbs. per acre at 40 lbs. per rupee		67 8 0
Straw per acre		5 0 0
Total Value of Outturn per acre ...		72 8 0

Cultivation in the Surat District.

The seed bed is prepared either in the field or in a plot of land commanded by irrigation from a well. The soil of the seed bed should be ploughed immediately, if possible, after the harvest of the previous year, and worked smooth by repeated harrowings, or hand dug in May, and the soil pulverized to a fine tilth. One full cart-load of old cowdung manure or goat manure should be given per *guntha* ($\frac{1}{40}$th part of an acre), and mixed thoroughly with the soil. In the southern part of the district *rdb* material is burnt on the seed beds, but the rainfall there is heavy, and this part of the Surat Collectorate really geographically belongs to the Konkan. The rainfall is much less where the seed beds are manured. At the end of May or early in June the seed is broadcasted in the seed bed. About six *gunthas* of seed bed are required for an acre of transplantation, and 90 to 100 lbs. of seed are broadcasted in the 6 *guntha* seed bed. The seed should be carefully covered, so that it is about $1\frac{1}{2}''$ to $2''$ below the surface. When the seedlings come up, all weeds should be removed. These may be numerous if farmyard manure is used. The seedlings are ready for transplanting three to four weeks after sowing.

The main field (*kiári*) is manured in May. There is a traditional saying in the district that *kiáris* should get one cart-load of manure per *vasa*—3 *vasas* = 4 *gunthas*. So the traditional rate of manuring comes to 30 cart-loads per acre. Very often the supply is not equal to this demand, but the very best cultivators give as much, or they top-dress the crop with castor cake to make up for a deficient supply of ordinary manure. The *kiári* (embanked field) is ploughed twice early in June, when it has been well soaked by the first monsoon rain, and afterwards, when the seedlings are nearly ready for transplantation it is puddled by further ploughing and trampling of the work-cattle. At this time a good deal (one foot or less) of water is impounded in the *kiáris*. The operation of puddling is called *ghaval* or *kádav pádvo*. After ploughing, a plank leveller (*pánya*) is used to level and smooth the surface. The field is now ready for transplantation, and the subsequent operations of transplanting, weeding and harvesting are precisely the same as already described for the Konkan. In Surat, however, particulary in the northern *tálukas*, rice needs several waterings late in the season, as elsewhere in Northern Gujarát, from a tank or other source of irrigation. Late in the season, particularly in a year of deficient or even slightly deficient rainfall, the water has to be lifted to the level of the discharge outlet of the tank, from which it flows to each rice bed by gravitation. The lifting may only be a few feet, and it is done very expeditiously and cheaply by means either of a scoop lift swung by two men or by means of a counterpoise water-lift which is described in the chapter on irrigation. The grain is threshed on a board, as already described. Subsequently, the straw is often trampled by bullocks. Thus the fodder is improved, and a little additional grain obtained. Further details of cultivation are sufficiently indicated by the tabulated statement below, which gives an estimate of the cost of cultivating a rice crop on *kiári* land in the Surat District :—

Cost of Cultivation.

	Per acre. Rs.	a.	p.
Preparing seed bed; tillage on 6 *gunthas* per acre of plantation ...	2	0	0
Manure 6 loads to seed bed and 20 loads to rest of acre area at As. 8 per cart-load	13	0	0
Cost of seed 80 lbs.	2	8	0
Ploughing and puddling *kiári* and levelling	4	12	0
Transplanting	2	8	0
Weeding seed bed and *kiári*	1	8	0
Top dressing with castor cake 200 lbs. per acre and application ...	3	0	0
Cutting, carrying, threshing paddy and winnowing in field for crop of 3,000 lbs. per acre	4	8	0
Tying and stacking bundles of straw (*párál*)	0	12	0
Cost of raising water (3 waterings)	4	0	0
	38	8	0
Add Government assessment ...	15	0	0
Total Cost of Cultivation ...	53	8	0
Probable outturn—			
3,000 lbs. of rice at 40 lbs. per rupee	75	0	0
Straw per acre	5	0	0
Gross Value of Outturn ...	80	0	0

BARLEY, *Hordeum*—Linn.

Stems annual, tufted, smooth. *Leaves* light green; *sheaths* smooth. *Spikelets* one-flowered, in pairs or threes in notches or joints of a simple, cylindric spike, with which they are parallel, oblong, compressed; *outer glumes* small, bristlelike; *flowering glumes* firm, *awns* long, stiff, with forward prickles. *Grain* grooved on the inner face, tip usually hairy, free or adherent to the pale.

1. *Hordeum vulgare*, Linn. Variety *hexastichon*, Aitchs. *Spikelets*, 6-ranked.

Vern., *Sátu, jav.*

2. *Hordeum vulgare*, Linn. Variety *distichon*, Linn. *Spikelets*, 2-ranked.

Vern., *Jau* (Sind).

3. *Hordeum vulgare*, Linn. Variety *nudum*, Ard. *Spikelets*, 2-ranked; *grain* free.

Vern., *Ua; Ujau; Naked or loose-grained barley.*

The foregoing botanical description is by Professor Gammie.

This cereal belongs to the natural order *Gramineæ*. Dr. Watt says:—"There are many strongly marked forms which, however, are generally regarded by botanists as referable to one species." The species he refers to is *Hordeum vulgare*. *Hordeum vulgare* var. *Hexastichon* is six-rowed barley. This variety was the most common in ancient times, and is that which is most commonly cultivated in India.

The finest two-rowed malting barleys of Europe and America belong to *Hordeum vulgare* var. *Distichon*.

Four-rowed barleys, known as bere or bigg in Scotland, and which is extensively grown in all cold countries, does not appear to be known in India.

Habitat. *Hordeum vulgare* has been found wild in Western Asia, and is among the most ancient of cultivated plants.

Distribution in the Bombay Presidency. Barley is not extensively grown in Bombay. The area is usually less than 40,000 acres. Ahmedabad grows half the total, Kaira 4,000 to 5,000 acres, Panch Mahâls 2,000, Sátára 4,000 to 5,000, Sholápur 3,000, Poona 1,000 and Ahmednagar 400 acres.

General characters of the plant. The straw of all varieties is short—rarely exceeding 2½ feet in length—and is a dry, brittle, rather unnutritious fodder. One reason for this is that the crop is always harvested when dead ripe. A single seed produces many shoots. In fact, the tillering power of the plant on rich soil is remarkable. Barley is nearly related to wheat. Its range of cultivation throughout the globe is more extended than any other cereal. It is found thriving in all latitudes from the tropical to the borders of the arctic zones and also at very high altitudes. This adaptability is not only due to its power to withstand heat and cold, but also to the fact that it grows rapidly, and thus matures in the short warm summer of northern latitudes or the equally short cold season of tropical and sub-tropical countries. The pales adhere to the grain in most varieties like spelt wheat, but there are two huskless varieties grown experimentally in the Presidency—the one has chocolate coloured grain and the other grain of a pale golden colour.

In most varieties the ears carry long, strong awns like bearded wheat.

A few varieties are awnless.

Rotations and mixtures. In the Presidency barley is grown as a *rabi* irrigated crop, and, like irrigated wheat, is often a second crop in garden land, and takes its place in rotation among the numerous garden crops grown. Barley is generally grown alone. Occasionally there is a sprinkling of rape or mustard. In parts of Gujarát wheat and barley are grown mixed (*jav kadu*).

Soils and climate. Barley is essentially a light land crop. The sandy loams of Kaira and Ahmedabad are particularly suitable, but the climate does not suit the crop so well as that of the North-West Provinces. The high day temperature on the sandy soils of Gujarát is too forcing. The crop ripens too quickly, and the grain is usually thin and light. In European countries, where the finest samples of malting barley are grown, the character of the season determines whether it does best on medium light land or on land of a heavier description. In a very dry season, light soil will only produce a crop of thin light grain, whereas, under similar conditions of season, heavy moisture holding clay may yield grain of the finest possible quality. It is very

likely that Bombay samples could be very much improved in quality if due regard be paid to selection of seed and thorough cultivation.

Cultivation—Sandy Soil—Ahmedabad District.

The land is well prepared by repeated ploughings, and at seed time is usually in the finest possible state of tilth. Barley more than any other cereal requires to be sown in thoroughly cultivated friable soil. It does not require such a firm seed bed as wheat does. Therefore, in the Ahmedabad District the common method of sowing is to broadcast the seed in the furrow behind the plough. The seed is thus sown in every furrow, the furrows being opened by the light plough and not more than 9″ apart. The soil moved in opening a furrow covers the seed sown in the previous furrow. The plough should not work more than 3″ deep, otherwise the seed will be too deeply buried. The method of sowing is only successful when previous tillage has produced a fine state of tilth to a depth of 4″ or 5″. As soon as the seed is sown, the surface is levelled and beds for irrigation formed. Barley does best on land in good "condition" from residues of manure applied to previous crops. If the land is not in good condition, a dressing of 10 to 15 loads per acre of thoroughly decayed manure should be given. The manure should be evenly spread over the surface of the field before the first ploughing. Manure applied directly to the crop usually produces a luxurious growth of weak straw which very likely will lodge. The grain is thus damaged in colour and otherwise.

Barley is sown usually in November. If it is not a second crop, it should be sown a month earlier. The seed rate is 80 to 100 lbs. per acre. If weeds appear, hand weeding is necessary. The preparatory tillage is usually so careful that very little hand weeding is required. The stirring of the surface soil with the weeding hook (*khurpa*) is, however, beneficial. An irrigated crop requires on a loamy soil water every week. A longer interval of ten days or so may be allowed on heavier land. The crop matures in about four months. 1,500 to 1,800 lbs. grain per acre, and about a ton of straw may be considered a full average yield.

Diseases.

Barley in Gujarát is practically exempt from disease, and probably on this account is grown in preference to wheat, the latter crop being often seriously damaged by rust.

Harvesting, etc.

The crop is harvested, threshed and prepared for market in the same manner as already described for wheat.

Economic uses of the grain.

Barley in the Bombay Presidency is only grown as a bread corn or as horse and cattle food. The gluten which the grain contains is not tough and elastic like that of wheat. Consequently, the bread does not rise well in baking. The grain of ordinary barley is often pounded like rice, to separate the husk. The clean grain, except that is more broken, resembles the pot or pearl barley which is used in European households to a considerable extent. Bombay barley is extensively used as a horse food, and for this purpose is usually parched before it is fed.

	Per acre. Rs.	a.	p.
15 loads per acre manure	7	8	0
Ploughing five times with *hal*	3	12	0
Ploughing and sowing seed	1	0	0
Seed 80 lbs.	2	8	0
Levelling and making beds for irrigation	1	0	0
Weeding by hand	0	12	0
Irrigation—2 men, 1 pair of bullocks, 4 months	22	8	0
Harvesting, carting, threshing and winnowing a crop of 1,600 lbs.	5	8	0
	44	8	0
Government assessment ...	7	0	0
Total Cost of Cultivation ...	51	8	0
Outturn—			
Grain 1,600 lbs.	50	0	0
Straw 1 ton per acre	6	0	0
	56	0	0

The Value of Barley for Malting and Brewing.

Barley derives its chief commercial value on account of its suitability for malting and brewing purposes. Other grains are used, but not so successfully. The finest kinds of pale ale can only be brewed from the finest description of malt, and that in its turn can only be obtained from the finest samples of barley.

The qualities which give value to the sample of barley for malting purposes are—

(1) Plumpness of grain and absence of light grain. Thorough winnowing and screening will improve any sample. Fine samples will weigh 57 or 58 lbs. per bushel.

(2) The grain should be bright, golden-yellow in colour and the pales fine and thin.

(3) Mellowness of grain. This is a trade term which is difficult to describe. It is used in contradistinction to steeliness which is an undesirable quality. All Indian samples are steely.

(4) Absence of damaged grains, *i. e.*, all grains which have lost vitality (*a*) by being broken or bruised in threshing, (*b*) by having germinated owing to exposure to wet, (*c*) by being heated in a stack. Damaged grain will not sprout during the malting process, but will rot and mould and lower the quality of the malt produced.

It is not at all likely that good samples for malting purposes can be produced in the Bombay Presidency. The Deccan Brewers import from the North-West Provinces. The difference in value in England between a sample of high class malting barley and a sample only suitable for grinding or distilling purposes is about Rs. 10 per quarter of 448 lbs.

(8 bushels). The English farmer aims at the production of the finest samples—

(*a*) By sowing seed which is plump, thin-skinned, of good colour, and true to variety.

(*b*) He grows his crop on suitable land and under favourable conditions of cultivation.

(*c*) The crop is reaped when fully ripe, and in fair weather is left in open bundles so as to derive for at least three nights the mellowing influence of dew. It is then bound into sheaves and stacked.

(*d*) The crop is stacked when dry. A slight degree of fermentation is beneficial. The slightest risk of heating is, however, avoided. Barley keeps free from any taint much better in stack than it does in bulk, therefore it should be disposed of as soon as threshed.

(*e*) Threshing, screening and winnowing are done carefully and thoroughly.

The Malting Process in England.

If necessary, the grain is thoroughly screened and winnowed before it is placed in the steeping vats or cisterns. It there remains fifty to sixty hours. It absorbs in this time a large quantity of water, and becomes swollen and soft. In this condition it is easily damaged, if not carefully handled. Therefore, the cisterns occupy the upper floors, and are self-discharging, the steeped grain being let down through "shoots" on to the germinating or growing floors. The depth of grain on the floor is regulated by the temperature of the season. The object is to generate sufficient warmth to stimulate the grain to germinate. It is important that growth should commence in the whole mass about the same time. It ought to begin in twelve hours, and be complete in ten or twelve days. It will be completed in a shorter time in India. During the process of growth a remarkable principle, known as diastase, developes, which has the power of converting the starch of the barley into dextrine and sugar. Growth is allowed to proceed sufficiently far to accomplish the change. Growth is then arrested by kiln drying the malt. The whole should be equally heated and equally dried. This is accomplished by a current of dry air heated to any desired temperature. The air supplied through pipes in a furnace is drawn in a continuous current through the perforated floor of the malt kiln, and is made to escape carrying the moisture of the malt with it through an exhaust-fan placed in the neck of a steam outlet in the roof.

The malt when dried is screened to remove the rootlets. These are known as malt dust or malt coombs, and form a valuable cattle food.

Beer is made by infusing the malt with water after it is crushed Wort and brewers grains are the products. The wort is fermented into beer, hops being first added to give bitterness and keeping qualities. The brewers grains in a fresh state are used chiefly as food for milk cattle, and are dried or dessicated, and keep good for any length of time.

OATS—*Avena*—Linn

Natural Order—*Gramineæ*.

Annual. *Stems* 2 to 3½ feet high, many from one root. *Inflorescence* loosely paniculate; *spikelets* smooth, large, pendulous, each with two or more perfect flowers. Flowering glumes awned on the back; grain furrowed in front, adhering to pale.

OATS—*Avena sativa*—Linn.

Vern., *Jai* or a corruption of the English word.

Watt says, oats are "of recent introduction into Indian agriculture."

Habitat.

The crop was first grown in Northern India under English auspices round cantonments and stud depôts for the supply of horses. The oat is cultivated in temperate regions throughout the globe, even so far North as the Arctic zone. Wild oats are persistent weeds in many of the cultivated fields in England.

Distribution in the Bombay Presidency.

In India the finest quality of grain is produced on the lower slopes of the Himalayas. The crop is grown to a considerable extent in the Delhi, Hissar, and Meerut Districts. In Bombay the crop is of minor importance. The area figures are not separately returned. Oats are sparingly grown in Poona, Ahmednagar, Sátára, and Ahmedabad, and also to a less extent in other districts.

Varieties and general character of the plant.

There are many varieties in cultivation. Those grown in India have been introduced from Europe. Except in the colder parts of India, the grain rapidly deteriorates. The best European varieties have clear, bright, strong straw which is not much inclined to "lodge" during wet weather. The grain should be short and plump, with a small percentage of thin, bright husk, and weigh from 44 to 48 lbs. per bushel. The colour of the grain varies—pale creamy-white, pale yellow, tawny yellow and brownish-black being the most common colours. Tartarian oats are either black or white. The pannicle in this variety is on one side of the flower stalk, and nods to one side as the grain ripens. A particular variety is known in Europe as winter oats. This kind is sown like winter wheat in Europe in October-November. It is not damaged by frost, particularly if snow covers the young plants. All acclimatized varieties grown in the plains in India produce long, thin grain with much husk, and the weight per bushel does not exceed 35 to 37 lbs. usually. The straw, if cut before the crop is fully ripe, provides excellent fodder. The crop is grown at remount and horse-rearing depôts in India, not so much for the grain as the fodder. It is cut green when the grain begins to fill or is nearly filled, and the produce is known as oat hay or "oats in straw." Such fodder is usually chaffed before it is fed to horse stock. This *bhusa* or chaff of "oats in straw" is the fodder which Australian importers use for their horses on the voyage from Australia to India.

Season; soils; mixture.

This cereal is only grown in the *rabi* season, and in Bombay always under irrigation. Oats grow best on well drained, friable soils of fair depth. Very light sand and

dense clay are not suitable. The crop is generally grown alone in Bombay, except in North Gujarát where rape is sown as a subordinate mixture.

Cultivation.

Oats are grown on the same kinds of soil and under the same conditions as irrigated wheat or barley. The preparatory tillage and the general cultivation for these crops have already been described. 100 lbs. of seed per acre is required. The seed should be broadcasted like barley. The crop comes to maturity in 3½ to 4 months. It should be harvested before it is dead ripe. The straw, when reaped, should have a distinct tinge of green. If left until dead ripe, the grain shakes or sheds out, particularly in windy weather. A good deal then falls to the ground and is lost. Green straw is, of course, better fodder than over-ripe straw. The crop is harvested with a sickle, like wheat. It should be in the sun two or three days in untied bundles. The grain can be threshed out like rice on a board, and the bundles of straw afterwards tied and stacked. It is perhaps best to trample out the grain under the feet of bullocks. Excellent *bhusa* fodder is thus obtained. A fair outturn from an irrigated crop on good soil is 1,800 to 2,200 lbs. grain and 25 cwt. straw per acre. The chief uses of oats in Europe is to provide oatmeal for human consumption and the grain as food for horses. Indian oats are used almost entirely as food for horses, and should for this purpose be invariably crushed.

Harvesting; threshing; outturn.

Economic uses.

MAIZE, INDIAN CORN—*Zea*—Linn.

Natural Order—*Gramineæ*.

Annual, very tall. *Stems* thick, solid, robust, rooting at the lower joints. *Leaves* large, broad, spreading and drooping, arranged alternately along the stems. *Male inflorescence* arranged in a loose panicle, terminating the plant; *female inflorescence* placed close to the stem, in the axils of one or more leaves, enveloped in sheathing bracts which are at first green and become grey-brown when dry; *styles* hanging from the tips of the inflorescence in a long, purple or white tassel; *grains* large, white, yellow, red, brown or black, densely and regularly embedded in a thick, spongy axis.

1. *Zea Mays*, Linn.

Vern., *Maka*, Maráthi; *Makai*, Gujaráti; *Goinjol*, *Mekkejol*, Kánarese; *Bhúta*, Hindustani.

The foregoing botanical description is by Professor Gammie.

General distribution throughout the world.

Maize is one of the larger and more important cereals of the globe. Excepting rice, it is more widely cultivated than any other tropical cereal. This plant furnishes the food grain of the great portion of the American

Continent. It is there known as "corn," and in the English markets is spoken of as "Indian Corn," because the first European settlers in America found it the bread corn of the "Red Men of the West." The origin of the plant is uncertain. It is supposed to be indigenous to South America, whence it was imported into Europe. Now it is extensively cultivated in Southern Europe, in Africa, in Australia and in the cooler portions of India. In America the varieties in cultivation are many, and it would be well for Indian cultivatiors if they exercised the same care in the selection of seed and the improvement of varieties as is practised in America.

General character of the plant.

The plant does not tiller. The stalks in India vary from 4 to 10 feet in height. In Kentucky and some of the Southern States of America it is common to find the crop standing 15 feet high. The grain is carried in an axillary spike (cob). The number of cobs on each stalk, as well as the size of the cobs, will be regulated by thin or thick sowing. Thin seeding on rich deep land will give strong, vigorous plants, carrying large well filled cobs, from which a greater outturn of grain will be got than from a crop sown at a higher seed rate.

Distribution in the Bombay Presidency.

Maize in the Presidency occupies about 140,000 to 160,000 acres annually. The Panch Mahâls claim two-third of the whole. Elsewhere the crop is of minor importance. It is, however, sparingly cultivated in Sholápur, Ahmednagar and Sátára as a grain crop and elsewhere as a fodder crop.

Soil and climate suitable.

The crop requires a hot climate, and is peculiarly susceptible of injury by frost or even cold. It likes a rich, deep, moist soil, well stocked with manure. The plant grows vigorously and quickly, and consequently must be liberally fed. Moreover, it requires a liberal, well distributed rainfall or irrigation when rain fails.

Cultivation in the Panch Maha'ls.

In the Panch Mahâls it is grown either as a rain or late irrigated crop. The *kharif* crop is most extensively cultivated, and is usually followed by a *rabi* crop of wheat or gram. Maize with a sufficient rainfall does best on the rich brown soils of Panch Mahâls, which have been brought under cultivation within recent years, and are more or less virgin. Rice land, retentive of moisture either by position or by depth and density, also suits the crop. It is usually sown alone. Its quick habit of growth does not make it a good companion for subordinate mixtures. Occasionally, as in sugarcane, members of the gourd family are grown with it. The practice of taking wheat after maize does not show much appreciation of the value of rotation. Gram after maize is of course better, and with an occasional application of manure this combination could be maintained through any number of successive years. Maize requires a soil deeply and carefully tilled. Consequently, in the brown soil of Panch Mahâls four to six ploughings are given with the light, indigenous plough. This is about equivalent to two good ploughings with a Deccan or Khándesh plough.

The land is as liberally manured (usually in May) as the circumstances of the cultivator will admit. Once in three years is about the average. The seed rate varies, as also does the method of sowing. 8 to 10 lbs. per acre would be sufficient if the seed were sound and properly distributed. The ordinary plan of sowing is with a two-rowed drill in rows about 20 inches apart. The seeds are large. Only an expert Kanbi can feed the seed with regularity and precision through the seed tubes. Consequently, a plan of dropping the seed by hand into every second furrow behind the plough is often adopted. The seed should be sown as early in June as the land can be properly prepared. The crop tests of the Presidency, show that 10 to 15 lbs. per acre of seed is the ordinary rate. The plant during the first month grows slowly as compared with its after progress, and this is one reason why it needs careful weeding while young. The crop should be once hand weeded and two or three times intercultured with a bullock hoe. The crop ripens in three or four months. It is difficult to get the exact outturn of grain in India, because a universal practice prevails of removing and selling unripe ears. Near large towns the whole produce may be disposed of in this manner, in which case the fodder being green is much more valuable. I am inclined to think that the mature fodder of the Panch Mahâls crop is more valuable than the cultivators believe. It is either used for thatching or burnt in the field, and is seldom fed to stock.

Harvesting; threshing; outturn.

The crop is harvested when dead ripe. The cobs are cut off the standing stalks, and, when sufficiently dry, are beaten with sticks to separate the grain. It is difficult to separate the grain from the cob unless the crop is dead ripe, and this is probably one reason why it is left to stand so long. Americans overcome this difficulty by using a husking machine. In the Panch Mahâls an average crop may be estimated at 1,200 to 1,500 lbs. This is poor when compared with the 40 to 60 bushels (2,400 to 3,600 lbs.) per acre of Kentucky.

Cultivation in the Deccan.

In the Deccan the crop is often grown for its fodder. We often find a sprinkling in sugarcane fields, which is cut long before the principal crops shade the ground. When sown alone for fodder, the four-coultered drill is used, and the rows are about 13 inches apart. 20 lbs. seed per acre may be drilled. The crop is cut as the plumes or male flowers make their appearance. As a fodder crop it quickly shades the ground, and therefore one hoeing is all that is necessary. The green fodder is excellent, being very sugary. It may be either fed green or dried and stacked. A heavy crop will yield over 20,000 lbs. of green fodder per acre.

Injuries to the crop.

Maize is peculiarly exempt from all diseases, but is often much damaged by pigs, monkeys, jackals, rats and parrots; and cobs being easily removed, night pilfering is common. The crop, therefore, requires careful watching both day and night.

Cost of Cultivation.

	Per acre. Rs. a. p.
Ploughing five times	4 0 0
Proportional cost of manure applied once in three years	2 8 0
Harrowing twice before sowing	0 8 0
Seed	0 4 0
Drilling and covering seed	0 4 0
Hand weeding (once)	1 0 0
Bullock hoeing (three times)	1 2 0
Watching	1 8 0
Harvesting, threshing and cleaning	2 4 0
Rs. ...	13 6 0

Cultivation in America.

In America the cultivation differs materially from that practised in India. In the former country it is planted in "hills," with as much exactness as tobacco is in the Kaira district. The distance between hills is 3 to 4 feet, with three to five plants on each. This exactness of planting facilitates interculture with horse hoe both lengthwise and crosswise of the field, as well as diagonally. The benefit is obvious. Formerly seed was dibbled in by hand; now a drill is used for the purpose. By a simple contrivance the seed is made to drop from the seed box with such regularity that the distance between hills is accurately the same. The cultivation of maize as a fodder crop in America is much the same as that of a grain crop in India. The seed is deposited in rows, just as it is in the Panch Mahâls, and with a similar distance between plants. In the Western hemisphere, the fodder of a mature crop is considered of much more nutritive value than it is in India. But there the leaves remain green when the cobs and lower ends of the stalks are dead ripe.

Varieties.

In America the varieties in cultivation are many. The grain, according to variety, varies in colour from a creamy white through all the shades of yellow and red to a dark chocolate. Some varieties have striated grain. The lighter coloured grains command in the English and American markets a higher price. Apart from colour, the grain of different varieties have other distinctive characters. The grain may be flat and long or short and rounded. There are sorts with small and large seed. The weight per bushel should exceed 60 lbs. One variety is extensively cultivated in gardens, because it furnishes cobs which, when the grain is partially filled, are much esteemed as a tender, delicate vegetable. They are superior to the coarse cobs offered in the Indian bazars, but are cooked and eaten in the same way. The pop corn of America is a distinct variety. The cob is small, and is densely packed with small, round, yellow, waxy looking seeds. These, if parched or roasted on a "popper," suddenly explode with considerable noise (hence the name pop corn), and, in doing so, the whole structure of the grain is turned outside in. The outer integuments are found inside, the flour outside.

"Popped" corn, cooked and prepared in a variety of ways, is considered a great delicacy. Although maize flour does not bake so well as wheat, the Americans have a greater appreciation of its value in bread making than any other nation. Hominy, maizina, cornflour are all preparations of maize used in European households. The starch of maize is very easily digestible, and preparations made from maize flour are used largely as food for children and invalids.

Economic uses of maize.

There is a practice common in America of saving part of the fodder before the crop matures, which perhaps might be advantageously adopted in India. The green side leaves are stripped off, dried, and bundled at the time when the cobs begin to fill. It is claimed that the outturn of grain is not materially lessened, and a considerable supply of excellent fodder is obtained. This method could not well be adopted in India unless the method of cultivation is changed. The rows are grown near together, and the plants stand so close in the rows that a field is more or less impenetrable, and the leaves when cut from the plants could only with difficulty be removed to the headlands. They might be fed green or converted into silage, but during the monsoon it would be long odds that the fodder would be spoiled by rain long before it could be dried sufficiently for storage.

Maize fodder.

In Austria the straw of maize is of commercial value for paper making for which purpose it is better adapted than most other grasses. It gives a very fine quality of paper, next in quality to that made from rags. In Austrian mills 300 to 350 lbs. dead leaves of maize give 100 lbs. paper, or as much as would be got from 160 lbs. rags.

ELEUSINE—Gærtn.

Annual, smooth. *Stems* tufted, stout, erect, compressed, 2 to 4 feet high. *Leaves* two-ranked, broad, mouth of sheath bearded. *Inflorescence* a cluster of 4 to 6 often strongly incurved spikes. *Spikelets* in two rows, 3 to 6 flowered, closely arranged on the upper side of the axis. *Grain* small, brown, enclosed in a membrane.

ELEUSINE INDICA—Gærtn., cultivated form
E. CORACANA—Gærtn.

Vern., *Bávto* or *Nágli*, Gujaráti; *Nágli* or *Náchni*, Maráthi; *Rági*, Kánarese.

The foregoing botanical description is by Professor Gammie.

Nágli is believed to be a native of India. At least five grasses of the same genus are known throughout the country, and some yield seed which in famine times is gathered as a food grain. The cultivated plant is widely grown in India.

Habitat.

Varieties.

Many varieties of *nágli* exist. They are comprehensively grouped in the Konkan and ghát districts of the Presidency as early (*halvi*) and late (*garvi*), the former ripening in late September or early October, the latter in late October or early November. The seed is small, round, reddish brown or lighter coloured, enclosed in a light drab membrane.

Distribution in the Presidency.

This grain occupies the fifth place among the Bombay cereals. In the Kaira and Ahmedabad districts of Gujarát and in adjoining Baroda Territory heavy crops are produced on highly assessed, alluvial soil. Elsewhere in the Presidency the cultivation is chiefly confined to the poorer, upland lands of the ghâts. Gujarát grows nearly 100,000 acres. In the Deccan, Násik grows 160,000 acres, Poona and Sátára about 60,000 each. In the Karnátak, Belgaum and Dhárwár have about 50,000 acres each, chiefly in the hilly parts of the western *tálukas*. In the Konkan, Thána grows 70,000 acres, Kolába 60,000, Ratnágiri 40,000, whilst Kánara has less than 10,000 acres.

Season; soil.

Nágli is entirely a rain crop in Bombay, and is generally grown in districts of heavy rainfall on land which is too light for rice or too steep to be converted into terraced rice fields. In the fertile, alluvial soil of Kaira and other parts of Gujarát it is grown on *besar* (clay loam) soil. It thrives well on such land with a well distributed rainfall of 30 to 35 inches, and even a heavier rainfall suits the crop admirably.

Mixtures and rotations.

In Gujarát, *nágli* is sometimes a drilled crop with *kodra*, *tuver* and sesamum, but is generally grown unmixed and from transplanted seedlings. It rarely occupies the same field oftener than once in three or four years, and is rotated with *jowár* and its subordinate mixture or with *kodra* mixed with *tuver* and sesamum or with such other crops as are ordinarily grown in *besar* alluvial soil. In the uplands of the Konkan and on and under the ghâts in the Deccan Collectorates the crop is grown mostly on sloping or steep land. In these hilly tracts the land is allowed to be waste for a number of years, usually from four to ten according to the kind of soil. When broken up for cultivation after fallow, the scrub growth and grass is cut and spread with other available rubbish evenly over the surface and burnt. Then a short rotation of crops is taken, the usual order on good upland *varkas* land being (1st) *nágli*, (2nd) *vari*, (3rd) *kodra (harik)*, (4th) *khurásni* (niger seed). *Nágli* is grown to some extent away from the ghâts on the borders of the Deccan plains, where the rainfall is 40 inches more or less, and is there rotated with *jowár* or *bájri*, each with subordinate pulse, etc., mixture. *Khurásni* is also a common crop in these fields.

Cultivation in Gujara't (Kaira District).

The nursery or seed bed is prepared with much the same care as for rice. Less manure is required. It is necessary to get the seed bed ready and the seed sown as early as possible. The seeds are small, and the seedlings

when young are very tiny and easily damaged or destroyed by heavy rain. It is, therefore, important to have the seed bed in a sheltered position. The seeds are so small that only a very small seed rate is actually required. Generally, more seed is sown than is actually necessary to furnish sufficient seedlings for transplantation. The cultivator looks ahead, and considers the risks of seedlings being destroyed by insects or heavy rain. Moreover, he selects, when transplanting, only the best seedlings. Weakling plants he does not use. 4 lbs. to 6 lbs. of seed sown in a *2-guntha* seed bed ($\frac{1}{20}$th part of an acre) will give, under ordinary conditions, an ample supply of seedlings for transplanting an acre. The seedlings are ready for transplantation when 4″ or 5″ high, and five weeks or so after sowing. The seed bed should be carefully weeded from time to time as required. The main field is got ready whilst the seedlings are growing. Manure at the rate of at least 15 loads per acre should be carted to the field and spread evenly in May. When the soil is moistened 6 inches deep by the first rains, the light plough (*hal*) should be used twice. Afterwards in July, when the seedlings are ready for planting, the plough should be again used; and by means of the plough, harrow and plank roller, the field should be made clean, friable and smooth. The seedlings may be planted, like rice, in muddy soil during falling rain—two or three together, and 8″ or so between plants. Another plan is to use the plough for planting when the soil is dry enough to be worked properly between showers. The plough should be guided straight to open a furrow about 3″ deep. The seedlings are placed by hand in the furrow 6″ to 8″ apart. The soil moved in making the next furrow covers the roots. The covering of the roots and the levelling of the surface is properly completed by hand. The furrows are 10 inches or so apart. If the work is expertly done, the crop grows in regular rows, the advantage of which is that the *karábdi* (narrow bullock hoe) can be used for weeding and interculture. The crop should be bullock hoed twice and hand weeded once. Dead seedlings should be replaced. Transplantation is most successful if moderate rain falls soon after, and continues with moderate breaks for some time. *Nágli* does best in Gujarát in years of heavy rainfall. The crop ripens in October.

Reaping; threshing; outturn.

The straw of a good crop is thick and very tough near the root, and is not easily reaped by a sickle. It is of poor nutritive value as fodder, and is often very carelessly harvested on this account, as well as owing to the cost of reaping. The heads of grain are, however, carefully gathered, and the straw or stubble is grazed subsequently by cattle. A fair average crop in Gujarát will yield 1,300 to 1,500 lbs. of grain per acre; a really good crop from a fertile, liberally managed field, 2,000 lbs. per acre. The grain as threshed (the membranous pericarp adheres to many of the seeds) is worth 40 to 45 lbs. per rupee in average seasons in Gujarát.

Parching unripe grain.

The green heads of *rági* are reaped as the seeds are nearly fully formed and parched. The cultivator treats himself and passing friends to this delicacy. The practice of parching unripe grain, particularly special varieties of *jowár*, is more common in Gujarát than in any other part of the Presidency. In fact, it is an indication of affluent, easy circumstances among the Pátidár cultivators.

Cost of Cultivation in Kaira District.

	Per acre of field. Rs. a.
Preparing 2-*guntha* seed bed and manuring it and seed	2 8
15 loads manure per acre for field	7 8
Ploughing and preparatory tillage (three ploughings, two harrowings, levelling with plank roller)	3 8
Transplanting—4 men and 12 women—lifting seedlings from seed bed and dibbling them into field	2 8
Hand weeding once and replacing dead seedlings	1 8
Bullock hoeing twice	0 8
Removing heads of grains from straw and threshing and winnowing ...	3 8
Cutting straw and tying into bundles	2 4
Assessment	7 0
Cost of Cultivation per acre ...	32 0
Outturn—	
1,500 lbs. grain per acre	35 0
Straw	4 0
Outturn per acre ...	39 0

CULTIVATION IN THE KONKAN.

The broadcasted crop.

It is not unusual to broadcast the first *nágli* crop taken after a long fallow on *varkas* land. The scrub growth is cut in the hot weather, and laid evenly over the surface. It is usually supplemented by branch wood carried from a distance, by dried grass and *harke* (straw of *harik*). The *ráb* material thus arranged is burnt. The seed (about 12 lbs. per acre and usually mixed with ashes or fine earth to secure even distribution) is sown broadcast in the *ráb* ashes and ploughed in with the first fall of rain. The surface is subsequently broken and levelled, but is usually left very rough. If ploughing is impracticable, as is often the case on steep land, the seed is covered by hand digging. The work in this case is done much better, and the surface is left fairly regular and smooth. On the more level and more fertile *varkas* lands, the land is ploughed twice as soon as possible after the first fall of rain, and worked to a fairly fine tilth. The seed is then broadcasted and covered by a light ploughing or by light hand digging, and the surface is made fairly smooth. The crop is hand weeded once and superfluous seedlings are thinned out. No further attention is required until harvest time.

The Konkan transplanted crop is grown from seedlings which are raised in a seed bed. The *ráhing* of the seed bed is considered as essential for the successful cultivation of *nágli* on the uplands as for rice in the lowlands. The field is prepared whilst the seedlings are growing. Three or four ploughings are given, and a fair degree of tilth is obtained. The best method of transplantation is to put the seedlings two or three together in holes made 3 or 4 inches deep and 6 or 8 inches apart by means of a pointed pole which is driven with considerable force into the soft soil to make these holes. The manure is applied directly into these holes. Sometimes it consists of half rotten fish mixed with ashes and sheep dung; sometimes a handful of goat or sheep manure or a piece of dried fish may be placed in each hole to half fill it. Then the two or three seedlings are inserted, and the surrounding earth pressed down upon the

roots. 300 or 400 lbs. of dried fish (*kuta*) per acre is an ordinary application, and on good level land sometimes about 800 lbs. per acre are given. A less successful way of transplanting is to put the seedlings into soft mud as in the case of rice, the field having been previously manured and worked. The leaves of the seedlings lie all in one direction. The seedling grows up right as it takes root, but usually many fail to do so. If heavy rain falls immediately after planting, the soil and seedlings get washed away on steep land; and if the rain is deficient, the seedlings wilt and die. Seed at the rate of 2 lbs. per *guntha* is sown in the seed bed, and a 4-*guntha* seed bed is sufficient for an acre.

Outturn.

The outturn in the uplands of the Konkan is very variable; so much depends upon season, particularly on regular, moderate rainfall at time of transplanting. The crop tests of the Presidency, which in the case of this cereal have been numerous, show that in seasons which are only moderately good, the outturn from a carefully cultivated upland field may range from 700 to 900 lbs. per acre; but the same land in a very favourable season and under similar cultivation may yield 1,300 to 1,600 lbs. grain and 2,000 to 2,400 lbs. of straw.

Harvesting and threshing.

The crop is harvested with a sharp sickle, and is allowed to dry for two or three days in the field and then tied up into bundles. The grain and straw are then stacked. The bundles are carried from the field in the morning when moist with dew. If handled much during the heat of the day, the grain falls out and is lost. The grain and straw are kept in stack until *Holi* (February-March). The straw, if thus stacked, is said to be improved as fodder. This is not likely unless a certain degree of fermentation is set up, which is improbable as the grain and straw are quite dry when stacked.

In the case of all cereals the stacking of grain and straw for some time makes the threshing process easier, and this is probably what is aimed at by stacking the crop for a definite period in the Konkan.

Nágli will keep good if stored in underground pits for a very long time. It is recorded that it has been stored safely in Mysore for half a century.

PANICUM—Linn.

Spikelets small, in panicles; *lowest glume* small, *second* and *third* subequal, *fourth* hardened in fruit and, with its pale, enclosing the grain.

1. *PANICUM CRUS GALLI*—Linn. Variety *frumentaceum*.

Vern., *banti* (Mándvi, Surat District); *Barti* or *Banti* (Poona Farm).

A tufted *annual*, smooth or hairy, height 2 to 4 feet; *leaves* rather broad; *panicles* erect or drooping, consisting of numerous, closely packed, in-curved, racemose spikes with thickened stalks. (Gammie.)

Banti is cultivated all over the plains of India and up the slopes of the Himalayas to a considerable height.

The grain is small, rounded at base, sharp at apex, flat on one side, smooth, shining. There are at least three varieties—a creamy white seed

securely enclosed in a dull brown, membranous covering, pale yellow seed securely enclosed in a pale yellow, membranous covering; and blue grey seed similarly enclosed in a drab coloured membrane.

Distribution in the Bombay Presidency.

The total area is less than 50,000 acres. The chief centres of cultivation are Ahmedabad and the Panch Mahâls in Gujarât. Elsewhere in the Presidency the cultivation is trifling. Throughout the Deccan on light land with a fair rainfall it is widely grown in little patches, often as a border with other crops.

CULTIVATION.

The land is prepared as for *bájri*. The seed is drilled with a four-coultered drill, usually alone in June-July, at the rate of 6 to 8 lbs. per acre. The rows are about 12" apart. The plants should be thinned out where the seed is sown too thickly. The plants can be readily transplanted in showery weather, and vacancies are filled up in this way.

A border or patch in a field is often grown from seedlings transplanted like *nágli* or *vari*. The drilled crop should be weeded and intercultured with the bullock hoe like *bájri*. The crop ripens in September-October. It is usually grown in the Deccan on poor, light, upland soil in parts where the rainfall is moderately heavy, and on such land a yield of 400 to 500 lbs. of grain and 1,500 lbs. of straw is a full average crop.

2. *PANICUM MILIACEUM*—Linn.

Vern., *Ghoti sáva* (Ratnágiri); *Vari* (Ambegaon, Poona); *Dudha vari* (Ratnágiri); *Cheno* (Nadiád); *Dhengli* (Sangamner).

Annual; stems leafy, 2 to 4 feet high, branches springing in tufts from the ground. *Leaves* rather broad, hairy, their sheaths loose, deeply grooved and thinly clad with long, white hairs. *Panicle* open and much branched; branches slender, spreading, drooping with the weight of the grain. *Spikelets* green, oval, pointed, smooth, *the lowest glume about two-thirds the length of the third and fourth.*

3. *PANICUM MILIARE*—Linn.

Vern., *Gajro* (Dohad, Panch Mahâls); *Vari ghudi* (Ratnágiri); *Halvi vari* (Ratnágiri); *Kuri* (Dohad, Panch Mahâls); *Sáva* (Khed, Poona); *Vari* (Khed, Poona); *Sáva* (Ratnágiri); *Sáva* (Ambegaon, Poona); *Vari mahán* (Ratnágiri).

A plant greatly resembling the last in appearance, but smoother; *panicles* denser and more compact; the *spikelets* smaller and rounder; and *the lowest glume is scarcely one-third the length of the third and fourth.*

The foregoing botanical descriptions by Professor Gammie show that considerable confusion exists in the vernacular names given in the Bombay Presidency to the varieties which he groups under the two botanical names *Panicum miliaceum* and *Panicum miliare.*

Several varieties of each of the crops provincially called *vari* and *sáva* were under experimental cultivation at the Poona Government Farm in 1899 and 1900. The crop called *káthli* in the Mával táluka, district of Poona, is very like, if not identical with, *ghoti sáva* (Ratnágiri District). *Vari* and *sáva* are hill millets, usually grown under totally different conditions of soil and rainfall than those near Poona. On the Poona Farm the plants did not thrive in the same way as under more usual conditions of cultivation. At the same time I should, without any hesitation, say that the terms *vari* and *sáva* as ordinarily used refer to two distinctly different crops according to the observation of any ordinary agriculturist. Both crops have late and early ripening varieties. On an average *vari* takes longer to come to maturity than *sáva*. The latter, I believe, has the more vigorous habit of growth, and has a peculiar lustre in the foliage which *vari* does not possess. The graceful, drooping panicles of *vari* are more evenly balanced than those of *sáva*, the latter nodding somewhat to one side. The chief difference between the two crops, from a purely agricultural point of view, is the difference in the seed. *Vari* has smaller grain than *sáva*. In each case the grain is oval, slightly pointed at each end, smooth, shining or polished. A membranous covering encloses the seed in each, and in both is fairly easily separated from the clean grain in threshing and winnowing. In the varieties of *vari* and *sáva*, which I have had the opportunity of examining, the membranous covering is darker in colour in *sáva* than in *vari*. In the former it is usually a dirty drab; in the latter a clearer, lighter drab. The seeds of *vari* which I have seen vary in colour, according to variety, from a dull clean white to canary-yellow or very light yellow-brown. The seed of *sáva* is distinctly darker in colour, and in the lighter shades has a distinctly dirty tinge. It may be dirty white, dirty yellow, dirty orange, a bluish slate colour and a dull green, and probably other colours according to variety. *Sáva* samples are much mixed as regards the colour of grain. Professor Grammie considers *vari* and *cheno* (the Gujarát crop) as botanically identical. Agriculturally, they are very different. The latter has much bigger seed, but of the same clear colour as *vari*. It ripens much quicker, and in Gujarát grows excellently as a hot weather, irrigated crop.

General characters of *vari*, *sáva* and *cheno*.

The agricultural differences which exist between *vari*, *sáva*, and *cheno* are, however, no greater than those found between different varieties of other cereals cultivated under varying conditions. Thus the cultivated varieties of *jowár*, of wheat, of barley, of maize and other cereals which are referable to particular tribes are often very unlike each other from an agricultural point of view, and perhaps it is not wrong to group together under the same head, as is done in this Presidency, the crops which may properly be classed as belonging to *Panicum miliaceum* and *Panicum miliare*.

Habitat.

Vari is believed to be a native of Egypt, but it must have been introduced into India at a very early date.

Distribution in the Bombay Presidency.

In the agricultural returns the areas under *vari*, *cheno* and *sáva* are entered together. This area varies from 300,000 to about 360,000 acres annually. *Vari* and these other companion millets occupy the sixth place among the cereals of the Presidency. The cultivation of *vari* and *sáva* is

almost limited to the Konkan and to the ghát parts of Násik, Poona, Sátára, Belgaum and Dhárwár. These millets are grown in similar soils and under like conditions to *nágli*. Both *vari* and *sáva* can be grown from transplanted seedlings, but the latter crop is more often produced from drilled or broadcasted seed.

Cultivation of Vari in the Konkan and Gha't Districts.

This cereal is a *kharif* crop, depending entirely on the natural rainfall and is never irrigated. It is raised, like *nágli*, from *rábed* seedlings, and the cultivation of both crops is much alike. While the seedlings are growing, the field is ploughed three or four times during the first three weeks of the rains. About 1 lb. of seed per *guntha* ($\frac{1}{40}$th acre) is broadcasted on the seed bed, and a 5 to 7 *guntha* seed bed will furnish seedlings sufficient for an acre of transplantation. Transplanting is done with the same care and exactness as in the case of *nágli* or rice. The number of seedlings planted together in one hole depends upon their strength. If they have grown vigorously in the seed bed, fewer are required.

Vari is grown unmanured, the residue left of the manure applied to the previous crop (*nágli*) being sufficient. The crop is commonly hand weeded once in August. If transplanted early in July, the late varieties of the crop ripen towards the end of October. The crop is reaped with a sickle, but as the straw is not used for fodder, and it has no other economic value, except for *rább*, usually a long stubble is left in the field.

Outturn and value. A full average crop on good *varkas* land will yield 700 to 750 lbs. grain per acre, worth usually 40 to 45 lbs. per rupee.

Economic uses. *Vari*, like *nágli*, is ordinarily a poor man's food grain. It is also used on fast days by the middle and richer classes.

Sa'va may be grown in precisely the same way as *vari* and the description of cultivation of the transplanted crops, outturn, etc., already given apply equally to both.

Cheno.—This crop is grown principally in Gujarát, chiefly in garden land, and as a hot weather, irrigated crop. The cultivation of *cheno* in Gujarát is popular, because it thrives well in the hot weather. It then provides excellent fodder in considerable quantity at a season when fodder is scarce. The cultivator of garden land is in the hot weather and at the beginning of the rains often hard pressed for fodder for his work cattle, because his energies are chiefly directed in producing market garden crops which, though very valuable, do not help him to feed the cattle which he requires for tillage and irrigation. In the Charotar villages of Baroda and Kaira, *cheno* often follows ginger or other market garden crops which come to maturity in December-January.

Cultivation. When ginger or other garden crop is removed in December-January, the land is ploughed several times. When a good tilth is produced, beds are formed for irrigation. The seed at the rate of about 10 lbs. per acre is carefully broadcasted and lightly covered. Light irrigation is given as required. The crop is usually hand weeded once. If sown at the end of January, it comes into flower in

March, and may then be cut green for immediate requirements. It gets fully ripe in April, and a good crop thickly covers the ground and stands about 3½ feet high. The seed is easily separated by beating small bundles of half sheaf size on a board. The straw is bound into bundles after the seed is threshed. A good crop will yield about 2 tons straw and 1,000 to 1,200 lbs. grain per acre.

KODRA—Paspalum scrobiculatum—Linn.

Natural Order—*Gramineæ*.

Tribe—*Paniceæ*.

Kodra—Gujaráti and Maráthi.

Harik—Kánarese and Maráthi.

Habitat.

Kodra is a native of India. *Kora*, a wild grass resembling *kodra* in the inflorescence, is common in the Bombay Presidency. All over India *kodra* is perhaps more extensively cultivated than any of the other inferior millets, the chief reason being that it is particularly well adapted for the poorest soils under favourable conditions of climate and rainfall. It is extensively grown on very poor soil in the Bombay Presidency. At the same time it is a popular and paying crop on the rich, alluvial plains of Gujarát.

General character of the plant.

A smooth, annual grass, stems numerous and branching, and 1 to 2 feet high, compressed. In height *kodra* is the smallest of the cereals. The grain head is either terminal or axillary, and consists of two or more spikes. The spikelets are arranged alternately along a common stalk in two, sometimes four, rows on one side of a flat rachis. The leaves over-top the inflorescence and the grain head is often partially concealed in the leaf-sheath. The grain is small, more oval than round, brown, smooth, enclosed in a light or dark brown membranous covering.

Distribution in the Bombay Presidency.

Kodra takes the seventh place among the cereals of the Presidency. The area varies from year to year. From 250,000 to 350,000 acres are annually sown. Gujarát claims the largest area. Elsewhere it is chiefly grown in Ratnágiri, the uplands of the Konkan and the ghát parts of the Deccan.

Season.

It is grown everywhere as a rain crop, entirely dependent upon monsoon rainfall.

CULTIVATION IN GUJARA'T.

Kodra is a very important crop in the *gorádu* soils of the Kaira District, and also in similar alluvial soil in the adjoining Baroda Territory. If grown alone *kodra* is considered an exhaustive crop, but in Gujarát it is never so grown. The usual mixture is *kodra*, *tuver* and *tal*, with a sprinkling of *ambádi* (*sheria*, Guj.), *i.e.*, Bombay hemp. This mixture is grown often year after year in the same field, without apparent diminution of outturn or exhaustion of soil if the fields are manured with fair liberality

and properly tilled. In low-lying damp fields in Gujarát rice and *kodra* are grown mixed in unembanked land. This mixed crop is called *vagadu*.

Gujarát cultivators believe that there is no advantage in preparing a field well for *kodra*. The crop likes a firm seed bed, and should be early sown, and the plough is rarely used in Gujarát for preparatory tillage. The bladed harrow is used instead. Soon after the first fall of rain, it is used to loosen the surface soil and prepare a friable, shallow seed bed.

This implement (*karab*) should be worked several times during preparatory tillage. The seed is drilled with the *tarfin* (three-coultered drill). The seed for the mixed crop is generally mixed before sowing. Each crop of the mixture is, therefore, found in all rows. A common seed rate per acre would be :—

12 lbs. *kodra*.
2 lbs. *tuver*.
⅛ to ½ lb. *tal* (sesamum).
½ lb. *sheria*.

After drilling the seed, the field is levelled with the *samár* (plank roller). Subsequently, the crop should be hand weeded once about a month or six weeks after sowing and bullock hoed two or three times. The bullock hoe, if the weather permit, should be worked as soon as the lines of seedlings are distinctly seen in straight rows. If there are any gaps in the rows, seedlings can be successfully transplanted in wet weather. In an ordinary season *kodra* sown in the third week of June in Gujarát is in flower in the third week of August. After this, tillage operations should cease.

Harvesting; threshing; outturn.

In Gujarát the *kodra* harvest generally comes before that of *bájri*. The latter crop is, however, sown seasonably later. Early in October *kodra* is generally ripe. It is reaped with a sickle and tied into bundles and, when dry, threshed by trampling of bullocks in the usual way. The results of a crop test show below the seed rate and outturn per acre of a good Kaira crop in a fair season :—

Mixture.	Seed rate per acre. Lbs.	Grain per acre. Lbs.	Straw or Useful By-product per acre. Lbs.
Kodra	12	985	1,304
Tuver	4	265	232
Tal	⅛	130	*Nil.*

A first class crop of *kodra* with subordinate mixture will yield in *goráàu* soil in Baroda Territory or in the Charotar villages of Kaira—

	Per acre. Lbs.
Kodra	1,200
Tuver	600
Tal	160

Cost of Cultivation in Gujarát.

	Per acre. Rs. a. p.
Proportionate value of manure applied once in three years	3 0 0
Preparatory tilling, three harrowings	0 14 0
Sowing and covering seed	0 6 0
Seed, *kodra* 12 lbs., *tuver* 2 lbs., *tal* ½ lb., *sheria* ½ lb.	0 6 0
Bullock hoeing three times	0 14 0
Hand weeding twice	3 8 0
Harvesting and carrying various crops of mixture to threshing floor	3 12 0
Threshing and winnowing various crops of mixture	3 4 0
	16 0 0
Add—Government assessment ...	7 0 0
Total Cost of Production ...	23 0 0

A poisonous principle in the grain and straw of *kodra*.

The grain as well as the straw of *kodra* contains in some seasons a poisonous narcotic principle. For this reason care is taken, at least in the Konkan, to prevent cattle trespassing into *kodra* fields. In Gujarát the poisonous and non-poisonous grain is respectively distinguished in the bazar as *mitha* and *mina*, but they cannot be distinguished by eye inspection or in any ordinary way. The poisonous principle in the seed and straw is probably due to an alkaloid developed under particular conditions of climate and seasons. It is certain that *kodra* grain and straw is only poisonous in particular seasons. Damp, cloudy weather towards harvest time, a damp season and a damp undrained soil are apt to produce poisonous *kodra*.

Cultivators in Gujarát claim that diseased grain can be detected as it is threshed on the threshing floor. The bullocks treading out the grain feel the effect of the poison from the dust which rises as the grain is being trampled out, and the driver of the bullocks is also similarly affected.

New *kodra* grain is not considered such a wholesome food as old. *Kodra* should be cleaned of the husk as required. The cleaned grain rapidly deteriorates if it is kept. It is generally a food consumed by poor people of inferior caste.

CULTIVATION IN UPLANDS OF KONKAN AND GHA'T DISTRICTS.

Kodra is the third crop taken after a long fallow, the previous crops being *nágli* and *vari*. *Varkas* land exhausted by the cultivation of these crops is sown with *kodra*. In order to get a good crop of *kodra (harik)*, *varkas* land should be well ploughed and otherwise well tilled. Generally, no manure is given. The seed is sown broadcast, at the rate of 15 to 20 lbs. per acre; afterwards the land is sufficiently worked and the seed is carefully covered. One hand weeding, if necessary, is given. The crop is sown in June-July, and is reaped in November with a sickle. It is allowed to lie in bundles of sheaf size, exposed to the sun for a week, and is then stacked. It is threshed by trampling on a threshing floor under the feet of bullocks.

SETARIA—Beauv.

Inflorescence, forming a dense, cylindric spike, each *spikelet* being surrounded at the base by deciduous bristles which vary in length in different forms of the same species.

Setaria Glanca—Beauv.

Vern., *Barati*, Poona District.

An annual grass, 1 to 2 feet high, slender, densely tufted. *Leaves* pale green, rather weak and narrow, slightly hairy. *Panicle* yellow, narrow, compactly cylindrical. 1″ to 6″ long, erect; *bristles* a little longer than the *spikelets* which are ovoid. *Glume* covering the grain transversely wrinkled. (Gammie.)

The seed is not so large as that of some kinds of Italian millet. It is flat on one side, otherwise tapers from a rounded base to a sharp point which is slightly hooked. Colour variable, generally yellowish-green, some seeds being of lighter colour than others and lighter towards the apex or point than elsewhere.

Habitat.

This grass is wild in the plains and to moderate elevations in the hills all over India. In Australia and America it is considered a good fodder grass. In the latter country it is known as bottle or pigeon grass.

General character of the crop.

A good crop stands about 2 feet high. The plants have enormous tillering power. A thick crop can, therefore, be got from a small seed rate, provided the seed is evenly scattered in sowing. The stalks are very fine, the leaf growth considerable, and the fodder at least good. The outturn of fodder per acre is not, however, heavy.

Distribution in Bombay soil suitable.

This grass is sparingly cultivated in the hilly parts of the Deccan on comparatively light soil with moderate rainfall.

Cultivation.

Barati is a rain crop, sown in June-July, and reaped in October-November. The field is prepared with the harrow, and should be clean. The seed is small, and requires careful sowing. If it can be evenly broadcasted, it is better to sow in this way than by seed drill. If a seed drill is worked, one with coulters close together should be used. A seed rate of 5 to 6 lbs. per acre of seed is sufficient, if the seed is evenly distributed. The seedlings are small and delicate when young, but when once they begin to tiller, a dense growth soon covers the ground. The crop needs no further attention till harvest time.

ITALIAN MILLET—*Setaria italica*—Beauv.

Natural Order—*Gramineæ*.

Tribe—*Paniceæ*.

Káng, Gujaráti; *Káng*, *Rála*, *Bhádli*, Maráthi; *Navani*, *Rála*, Kánarese.

Annual, almost smooth grass. *Stems* 2 to 5 feet in tufts. *Leaves* rather long and broad. *Sheath* smooth, with a bearded mouth.

Inflorescence with a lobed surface, nodding or altogether drooping, according to the development of the grain, from 2″ to 6″ or more long, yellow, yellow brown, dirty brown or greenish brown in colour; length of bristles very variable, but, as a rule, shorter than the spikelets in well developed, and longer than the spikelets in poorer examples. (Professor Gammie.)

The grain is very easily rubbed out from the head of grain. It varies in size and colour according to variety. The seed is oval, more pointed at one end than the other, smooth, shining. The more common colours are creamy white, dirty creamy white, yellow orange, light red brown. In one variety brownish black glumes enclose creamy white seeds.

Origin.

Dr. Watt states that this millet is found wild in India in the Himalayan range. It was cultivated at a very early period in China, Japan and the Indian Archipelago, and its cultivation spread westward from these centres.

Distribution in the Bombay Presidency.

Káng is cultivated all over India, but in no part is the cultivation very important. In the Bombay Presidency the crop is annually becoming more popular, and the area has considerably increased within recent years.

The Gujarát areas are very small. In the Deccan the crop is important in Sátára and Ahmednagar. The Karnátak Collectorates are the chief centres of cultivation. Belgaum and Dhárwár each grow over 70,000 acres and Bijápur over 20,000 acres. The total for the Presidency exceeds 200,000 acres annually.

General character of the plant.

Káng is a quick growing cereal and a suitable crop to grow after a period of famine or scarcity. It produces a good deal of grain and a fair amount of fodder in quick time. It thrives best on medium light soil, and does better than other millets with deficient rainfall. The straw makes good fodder.

The straw of a good crop stands 5 or 6 feet high, and the spikes are 7″ long. In a poor crop raised under unfavourable conditions of soil and climate, the straw and heads of grain are much shorter. Some Bombay varieties have shorter stalks, smaller heads of grain and smaller seeds than others.

Cultivation in the Karna'tak.

The land is prepared in the ordinary way by once ploughing and by two or three harrowings. Generally, no manure is given. The crop is sown with the drill usually in July-August. The four-coultered drill is used. The rows are 12″ to 14″ apart, and the seed rate is 6 to 10 lbs. per acre. Usually, no subordinate mixture is sown with *káng*. The crop is hand weeded and intercultured with the bullock hoe like *bájri*. It ripens in three months, and is cut very close to the ground with a sickle. The reaping consists in partly cutting the straw and partly uprooting the plants. The spikes of grain are cut off and threshed under the feet of bullocks like *bájri*. The straw is so fine that there is no particular advantage in trampling it into *bhusa* in the threshing process.

A Dhárwár crop tested in 1894 yielded as under:—

Seed rate.	Grain per acre.	Straw per acre.
Lbs.	Lbs.	Lbs.
6¼	843	2,631

PIGEON PEA—*Cajanus indicus*—Spreng.

Natural Order—*Leguminosæ.*

Sub-order—*Papilionaceæ.*

Tribe—*Phaseoleæ.*

Gujaráti, *Tuver*; Maráthi, *Tur*; Kánarese, *Togari.*

Origin.

Equatorial Africa is believed to be the original home of this pulse. It has long been cultivated in Africa and Asia, and in historic times its cultivation has extended to the West Indies, where it is now a common pulse.

Varieties.

Duthie and Fuller state *C. flavus* and *C. bicolor* are in the North-West Provinces recognized as two botanical varieties. The former is called *thur*, the latter *arhar*. The standard of the papilionaceous flower in *arhar* is veined with purple, whilst in *tuver* it is plain yellow.

In the Bombay Presidency there are two varieties—(1) a variety with white seed grown mostly in Gujarát; (2) a variety with red or light brown seed grown to a slight extent in Gujarát and in general cultivation throughout other parts of the Presidency. These varieties appear to hybridize freely when grown mixed. The seed of the hybrid is much lighter coloured than the red, being usually white-marbled with red. The red seeded variety does not grow well in the black soils of Surat and Broach. In the Deccan experimental trials have proved that both varieties appear to thrive equally well.

General habit of growth.

The extent and habit of growth of *tuver* varies greatly on different soils and in different seasons. In rich deep soil in a favourable season *tuver* grows into a much branched shrub, sometimes 6 or 8 feet high, with a stout stem near the root. In Bombay it is almost always grown subordinate to, or mixed with, other crops. Its period of growth is much longer than that of the other crops with which it is grown. *Tuver* is a strong feeding, deep rooted plant which is not easy to suppress even if the season is specially favourable to other crops with which it is mixed. When such are reaped, the *tuver* has not usually assumed any great vigour of growth, but soon after, the greater air space given, promotes a rapid growth of side branches, and in good soil in a favourable season the crop will soon completely shade the ground. The long tap roots extend far into and open out the sub-soil. They seek out moisture, and plant food there. The crop resists drought in a remarkable degree, and in deep soil continues to thrive right through the *rabi* season, though sown usually in June. It litters the

surface soil with a heavy top dressing of fallen leaves as it ripens, and, like other leguminose plants, adds to the soils stock of nitrogen. *Tuver* is a favourite crop with cultivators, and there is good reason that it should be so, for it stands in the forefront amongst pulses as a restorative, rotation crop.

Distribution in the Bombay Presidency.

Statistical returns give an annual area which generally exceeds 600,000 and sometimes approaches 700,000 acres. These are estimates of actual area sown. Thus if a field has *tuver* in every fourth row, only a quarter of the area of the field is returned as occupied by *tuver*. In favourable soil and in a favourable season it branches out, and might be considered a second crop, occupying practically the whole area of the field. Therefore, it would be more correct to estimate its area as that of the fields in which it is grown, and that area is probably four times that of the statistical area. The crop is of much more importance in Gujarát than the statistical area figures indicate. In many *bájri*, *jowári* and *kodra* fields in Ahmedabad, and Kaira especially, there is a decided sprinkling. In Surat every *jowár* field has subordinate *tuver*. The Broach crop is mostly *rabi*, *tuver* and sesamum being a common mixed crop in that district sown about September. All the Deccan districts grow *tuver* extensively. Ahmednagar and Sholápur grow most, Poona least. All three districts of the Karnátak have extensive areas. The crop is not of much importance in the Konkan.

Soils.

Tuver grows to greatest perfection in the deep alluvial soils of Ahmedabad, Kaira and adjoining Baroda Territory. The *besar* soils (medium clay loams) in the Charotar villages of the two latter districts suit the crop best. It does exceedingly well on black soil of fair depth, particularly if the *rabi* rains are full average. On lighter soils throughout the Deccan it is extensively grown, but, except in the most favourable seasons, grows as a puny plant on such soils.

Mixtures and rotations.

It is, perhaps, unnecessary to refer to these, as they have been incidentally noticed in describing the various cereal crops. In *bájri* or *jowár* fields *tuver* usually occupies separate rows. Sometimes, however, the seed is sown mixed. When *kodra* and *tuver* are grown together, the seed is mixed before sowing; thus *tuver* and *kodra* plants grow in every row. Sesamum and *tuver* and rice and *tuver* are also common mixed crops in Broach and Surat, the latter mixed crop being grown on unembanked fields.

CULTIVATION.

The *tuver* participates in the general tillage of the principal crop with which it is grown. This tillage has already been described for the various cereals. The seed rate varies from 1½ lb. per acre for a row crop to 2 or 3 lbs. per acre when grown mixed with rice or sesamum or *kodra*. There is no harm done in sowing an extra pound or two of seed per acre. Superfluous seedlings are easy to remove. The strongest and the healthiest should be left. In poor soil the plants may be left 6 inches or so apart or even less in the rows. In deep soil in good condition, they should be thinned out to 12″, 15″ or even 18″ apart. *Tuver* is generally left more

or less to take care of itself. This it is well able to do. There is a common country saying in the Deccan that the more *tuver* is trampled and broken when the cereal crop is reaped, the greater will be the subsequent development of the branches, flowers and fruit. This is probably true to a certain extent. The pods begin to ripen in January. Flowers and ripe pods may always be found on the same branch between January and March. It is impracticable to leave the crop until all the flowers produce ripe legumes. Successive crops may be gathered green or ripe. Green pods give seeds which are used like green peas as a vegetable. Pods when quite ripe should not be left very long ungathered, otherwise they open and shed their seed. Ripe pods gathered by hand are carried home and the seed beaten out with a short stick. In March the plants are cut at the root. It requires a sharp sickle for the purpose. They are tied into small bundles and carted to the threshing floor at once, a coarse cloth being spread in the bottom of the cart to catch seeds which shell out. The bundles are stacked on end for a few days, the green leaves dry, and the ripe pods open more or less. The pulse and leaves and husks of pods are easily threshed by beating the bundles sharply on a log of wood. The *bhusa* when separated by winnowing provides excellent fodder. The stalks are used for fuel, for making baskets, for wattling the sides of the carts, and when well grown are sold to be made into charcoal for gunpowder. The plant is rich in potash, and this possibly adapts it specially for the last named purpose.

Outturn.

It is difficult to estimate what an average yield of *tuver* really amounts to. 100 to 150 lbs. per acre would be considered a good yield from medium black soil in the Deccan from a crop occupying every fourth row in a *bájrí* or *jowár* field. In the Charotar villages of Kaira a good yield of *tuver* in a mixed crop often amounts from 800 to 1,000 lbs. per acre. On the Poona Government Farm in medium black soil *tuver* subordinate to *bájri* in every fourth row has repeatedly yielded between 500 and 600 lbs. per acre. The highest yield was 787 lbs. per acre; but in this particular crop the *bájri* was poor owing to the character of the season, whilst the *tuver* was excellent.

The crop has been grown alone in various experimental plots at the Nadiád Farm since 1891. The seed has been sown in rows, about 3½ feet apart. The yield in one year was 2,200 lbs. per acre, and generally has been about 2,000 lbs. per acre. The experience at Nadiád has proved that *tuver* can be safely grown alone on good deep alluvial soil and, when thus cultivated, is profitable.

Economic uses.

Tuver as a split pulse is a common human food. The outer integument of the seed with part of the kernel is a favourite food for milk cattle. Such is sold under the name of *chuni*. The feeding value is variable, because the proportion of husk and of meal is by no means constant. *Chuni* containing much husk has poor feeding value.

Value.

Tuver is usually worth 35 to 40 lbs. per rupee, but in out districts it is sometimes very cheap—50 lbs. or more per rupee. The crop is usually grown without much risk of damage by disease or other mishap. Very cold nights do harm, also cloudy weather. In each case the flowers do not properly fertilize.

GRAM OR CHICK PEA—*Cicer Arietinum*—Linn.

Natural Order—*Leguminoseæ.*

Sub-order—*Papilionaceæ.*

Tribe—*Vicieæ.*

Gujaráti, *Chana*; Maráthi, *Harbhara* or *Chana*; Kánarese, *Kadle.*

Origin.

This pulse is sometimes called Bengal gram to distinguish it from *kulthi (Dolichos uniflorus)*, which is known as gram or horse-gram in Madras. Gram is probably indigenous in South Eastern Europe or South Western Asia. Its cultivation in India is ancient. The Sanskrit name is *chanaka.* It was cultivated by Greeks in Homer's time. Its cultivation in Egypt dates back to at least the early Christian Era. The Romans called it *cicer.* It is called *arietinum* from the fancied resemblance of the seed to the head of a ram when first forming in the pod.

Varieties.

There are at least four varieties in cultivation in the Bombay Presidency. They differ only as regards the colour of the seed. The plants in other respects cannot be distinguished. The seed of the different varieties varies as follows in colour:—(1) black, (2) dark red or reddish brown, (3) yellow or yellowish-red, (4) white or creamy white. The three first are generally grown indiscriminately together. The yellow gram of Gujarát is larger than that produced in the Deccan. This may or may not signify difference of variety. Yellow gram, if true to variety, commands a higher price than the mixed. White gram is grown on a small scale in the Ahmednagar district. It is probably the same variety as that described by Duthie and Fuller as Cabuli gram; but the seed of the Deccan crop is not larger than that of the more common varieties.

Distribution in the Bombay Presidency.

The area varies considerably from year to year according to season. In years of heavy September and October rainfall the gram area is generally larger than in years when the late *kharif* rains are scant. But this is not always the case. The cultivators may consider the season more suitable for wheat, and as dry crop wheat and dry crop gram are grown largely on the same description of soil, and in the same tracts of country, these crops are more or less interchangeable. Usually the total area of gram in the Presidency ranges from 600,000 to 700,000 acres. The Panch Mahals grows the largest area in Gujarát, but the crop is also important in Ahmedabad and Kaira.

In the Konkan little gram is grown. The crop is extensively cultivated in all districts of the Deccan and Karnátak. The areas range between Collectorates from 40,000 to 70,000 acres. Ahmednagar is the most important district, and grows sometimes over 100,000 acres.

Soils suitable; mixtures; rotations.

Gram in the Presidency is always a *rabi* crop. It is grown in three ways—(*a*) as a dry crop in deep black soil when usually it is the sole crop of the year; (*b*) as a dry second crop usually after rice in rice beds, but occasionally, as in Panch Mahals, on ordinary dry crop land after a

kharif crop of maize; (*c*) as an irrigated crop liberally manured and regularly watered.

Dry crop gram does best on deep retentive black soil, such as the wheat lands along the Tápti in Khándesh and the Godávary in Ahmednagar. It also does well on alluvial soil of rice beds when such are clay loams. These are naturally fairly retentive of moisture, and on account of favourable position usually hold sufficient moisture to properly mature the crop, even if the rainfall after sowing is trivial in extent as it generally is. In parts of the Deccan gram is grown on medium black soil; sometimes entirely as a dry crop, but oftener is helped by one or two waterings. The cultivation is risky on such land unless the cultivator has means of irrigation at hand. He generally has this either from a well or canal, and, failing a sufficiency of moisture in the soil from natural rainfall, he irrigates once or twice. The field is not laid out for regular irrigation. He leads the water over the surface in the best way he can if he is compelled to irrigate to save his crop when it shows signs of withering. Gram which is regularly irrigated is fairly commonly met with in the Deccan, especially under well irrigation. Medium black soil of fair depth and resting on *murum* is best suited. Such land grows in rotation with gram irrigated crops of wheat, *jowár*, onions, sweet potatoes and other vegetables, but is rested from irrigation every second or third year, and then ordinary rain crops are grown.

Gram is most commonly grown alone. The practice of growing wheat or barley mixed with gram, which is common in the North-West Provinces, is unknown in the Bombay Presidency. In Khándesh linseed in separate rows is occasionally grown in the gram fields. In the Ahmednagar District and in the Karnátak safflower is the subordinate row crop.

A good rotation crop for reasons given.

Gram is everywhere recognized as a valuable rotation crop, either on dry crop land or under irrigation. It is restorative like other leguminose crops. A good crop is dense and shades the ground and, therefore, suppresses weeds. On dry crop black soil it is practically a fallow crop sown after thorough tillage. The succeeding crop, therefore, is benefited to a considerable extent.

Cultivation on Black Soil as a Dry Crop.

Gram and wheat are, according to the character of the season, interchangeable, and both crops receive the same preparatory tillage. That for wheat has already been fully described, and need not be repeated. The field should be ready for sowing by the end of September. The crop is sown then or during October. If sown later, there is risk of the soil moisture failing before the crop reaches maturity. A heavy two-coultered drill is used for sowing. The rows are generally about a foot apart. The usual seed rate is 40 to 50 lbs. per acre. A crop sown in October ripens in February. Meantime, it is rarely weeded.

Pruning gram.

When the seedlings have begun to branch, the leading shoots should be nipped off in order to encourage branching and the formation of more flowers and fruit. Care must be taken that the plants are not cropped too much. A healthy, vigorous crop on rich soil can stand a good deal of pruning. But an

ordinary dry crop that scarcely covers the soil will not stand so much. The work costs nothing. The farm servants will do it in their own time if allowed to take the nipped shoots. These are sun dried, stored and used as required as a green vegetable. The effects of pruning against non-pruning were tested at the Poona Farm for three consecutive years, with the results tabulated below. The crops were grown under light irrigation on medium black soil in good condition :—

	Outturn of Pulse per acre.		
	1893-94.	1894-95.	1895-96.
	Lbs.	Lbs.	Lbs.
Nipped crop	1,375	1,325	1,650
Unnipped crop	1,090	1,071	1,545

A useful by-product.

In walking through a crop of gram it may be noticed that boots or clothes are discoloured by an acid substance which is abundant if there is dew on the foliage. This under the name of *ámb* is used medicinally in the Deccan. It consists of oxalic and mallic acids, with a little acetic acid. It can be collected by spreading wet cloths over the foliage and wringing out the absorbed *ámb*.

Harvest.

Gram, as it ripens, changes to a rich yellow brown colour. Many of the leaves drop off and litter the ground. It is reaped with a blunt sickle, or is mostly uprooted. The reaped handfuls are made into little heaps, and, if there is wind, a clod of earth is put on each heap to keep it from being blown about.

Threshing and winnowing.

Gram *bhusa* a good fodder.

The crop needs three or four days' exposure to the sun before it is threshed. It is threshed under the feet of the bullocks and winnowed in the ordinary way. The fine chaff makes excellent fodder. It has an acid taste, and, if mixed with the *bhusa* of wheat, gives the whole mass an agreeable flavour which all kinds of farm stock relish. The coarser stalks with roots have poor feeding value, and are usually separated during the winnowing process. 500 to 600 lbs. pulse per acre may be considered a fair average dry crop on black soil under ordinary cultivation. But, as already noted, a liberally managed irrigated crop on good soil will yield much more.

Cultivation in Rice Beds, Gujara't.

The field is ploughed once or twice after the *kharif* crop is removed. If twice, the second ploughing is across. The seed is then drilled, sometimes broadcasted. The drilled crop needs about 50 lbs. seed per acre, the broadcast crop more. An ordinary two-rowed heavy drill may be used, but oftener the seed is passed through a single tube fixed behind a plough, which is worked to a depth of 3 inches. The seed drops in the furrow made by the plough, and is covered by the soil moved in making the next furrow. The surface is then more or less levelled, but usually is left rather rough. If, however, the soil holds sufficient moisture, the crop thrives. It requires no further attention till harvest time, except that it should be nipped as previously described. A good crop yields 800 lbs. pulse and about the same weight of fodder.

Cultivation of Deccan Irrigated Crop.

The field is either directly manured or in good condition from previous applications. It requires careful tillage. It should be ploughed

and worked until the soil is smooth and friable to a depth of 3 or 4 inches. The seed is best sown by hand in the furrow behind a plough. It should be sown in every furrow. 60 to 70 lbs. seed per acre will be required. The soil moved by the plough covers the seed to the depth of 3 inches. The rows are about 9 inches apart. Part of the soil is afterwards moved by hand rake or hand hoe to level the surface and form small ridges round the compartments for irrigation. Water channels must also be formed by opening with the plough and deepening and finishing with a hand spade. If the field is fairly level, the arrangements for irrigation may be simplified by forming long narrow beds along the least slope, generally along the whole length or width of the field. Such beds may be 3½ or 4 feet wide. They are divided from each other by ridges of soil, and water admitted to each bed in turn should flow slowly along the entire length of each. An elaborate system of beds and water channels is not so much required for gram as for other irrigated crops, because if gram is sown in damp soil in October, it rarely needs irrigation oftener than perhaps three times.

If weeds appear soon after germination, as they are certain to do if the crop is manured with farmyard manure, such should be removed as early as possible. One hand weeding is sufficient. The crop needs no further attention except nipping and watering until harvest time.

Diseases, blight, etc.

Irrigated gram must not be grown too often in the same land. Such a course causes diseased conditions. The crop withers in patches long before it reaches maturity, and the pods when examined are either empty or contain shrivelled seeds. The roots rot, so that plants are easily uprooted. The crop to a certain extent is delicate. Cold is harmful. Frost is fatal. Cloudy weather does harm, and heavy rain, when the seedlings are small, is disastrous. The crop in Gujarát, like *láng (Lathyrus sativus)*, is sometimes infested with grubs which eat into the pods and consume the seeds and find their way out again as the crop ripens. In the Deccan in average seasons the crop is fairly hardy and not liable to many risks or mishaps.

Economic uses.

The gram plant is useful in a variety of ways. It is used green as a vegetable—both foliage and grain. The ripe grain is used for *dál* or is eaten parched or made into sweetmeats. Gram is extensively used to form at least part of the concentrated daily ration for horses, and is an excellent food for fattening sheep. Gram which has been seasoned for some months is best for the two latter purposes. Such pulse is always in request and usually dear. In towns it is rarely less than 24 to 28 lbs. per rupee, and often is dearer.

Cost of Cultivation—Dry Crop Gram, Khándesh.

	Per acre. Rs. a. p.
Clearing stubbles of previous crop... ...	... 0 6 0
Harrowing three times in hot weather ...	... 0 12 0
Ploughing once	... 1 8 0
Harrowing four times during rains ...	... 1 0 0
Drilling and covering seed	... 0 9 0
Cost of seed 45 lbs.	... 2 0 0
Harvesting, drying and carting to threshing floor	... 1 4 0
Threshing and winnowing	... 1 0 0
Total Rs.	... 8 7 0

CHICKLING VETCH—*Lathyrus sativus*—Linn.

Natural Order—*Leguminoseæ.*

Sub-order—*Papilionaceæ.*

Tribe—*Vicieæ.*

Gujaráti, *Láng*; Maráthi, *Lákh.*

Habitat.

This pulse is indigenous from the Caspian Sea to the North of India, and has spread as a weed of cultivation. It is cultivated extensively throughout the North of India, where it is known generally by the vernacular name *kesari* or a corruption of that word.

General character of the plant.

The plant is a procumbent annual which, if once seen, cannot, on account of its peculiar foliage, be confused with other cultivated pulses. The pods are about 1 inch long. They contain four or five seeds. These are ovate or wedge shaped, flattened on two sides, purplish grey in colour, and variegated or marbled. It is generally known that the seed contains a poisonous alkaloid principle and that the habitual consumption of this pulse or its continual use as food for a few months causes paralysis of the lower extremities. The alkaloid is volatile and destroyed by heat. Therefore, if the *dál* of *láng* be properly cooked, there is less risk of bad consequences. This pulse is only eaten by the poorest people. It is exported from Bombay to Zanzibar, and is probably used there as food for coolies.

Distribution in the Bombay Presidency.

Broach is the chief centre of cultivation. This collectorate generally grows 40,000 to 50,000 acres annually. Surat and Násik grow 3,000 to 4,000 acres each. In other districts the areas cultivated are very trifling.

Mixtures.

Láng is almost invariably grown alone. Occasionally a slight admixture of *láng* may be found in gram (*Cicer arietinum*) fields, but the admixture is accidental and not intentional.

Soil suitable.

Láng thrives best on deep, retentive, black soil. In the Deccan it is chiefly a second crop in rice fields, whereas in Gujarát it is generally the sole crop of its year, although occasionally, like *vál*, it is grown as a second crop in rice beds. In Broach in wet seasons fields, which become water-logged and too wet for cotton in the *kharif* season, are sown with *láng*. *Láng* is a hardy pulse and easily cultivated. Some authorities state that it will grow successfully on soils unsuited to any other pulse. In Duthie and Fuller's "Field and Garden Crops" its suitability for heavy clay soils is referred to, and it is further stated that if the seed is sown broadcast on miry ground, the crop is not so injuriously injured as other crops by the subsequent hardening and cracking of the surface.

CULTIVATION IN BROACH.

In this district the crop responds to careful cultivation and liberal treatment. It is usually grown on low-lying fields which are liable to be

flooded by heavy rains. It often happens that a field intended at the beginning of the season for cotton is sown with *láng*. Therefore, tillage operations begin by ploughing soon after the first fall of rain. The field may be ploughed twice, and if the rainfall prove unfavourable for cotton, it is kept for *láng*, and is repeatedly harrowed as occasion permits during July, August and September. The tillage thus given is thorough, and all weeds are destroyed. Generally no manure is applied. The cultivator knows that a good crop of *láng* on clean land is a very good preparation for cotton in the following year, and he prepares the field carefully for *láng* for this reason and also because there is a direct profit from increased outturn. The crop is sown late in September or early in October. The usual seed rate is 35 to 40 lbs. per acre. The seed is sown usually through a single tube fixed behind the plough. It is dropped in the furrow made by the plough. The seedlings come up more or less in rows, but not in such distinct lines as when seed is sown by an ordinary coultered drill. The rows are about a foot apart. The surface is levelled and pressed immediately after sowing by the plank roller. The field is generally so well prepared that no hand weeding is required and no further attention is needed till harvest time. A good crop forms a thick close mass over the whole surface, and smothers such weeds as attempt to grow and, when reaped, leaves the surface as clean as that of a fallow field.

Harvest. The crop ripens in February about four and a half months after seed time. It is sufficiently ripe when the foliage begins to turn yellow. It is always reaped before it is dead ripe. A blunt sickle is used, and the crop is partly reaped and partly uprooted. It is formed into small heaps in the field, and allowed to dry for a week. Then the heaps are turned, and, after a few more days' exposure, the crop is ready for threshing.

Threshing. It is threshed out under the feet of bullocks, and winnowed in the ordinary way. In a well grown crop with even germination and a full plant the weight of pulse per acre should be about equal to the weight of *gotar* (*bhusa* fodder). The fodder is considered to have high nutritive value, and in ordinary seasons it is readily saleable at 120 to 160 lbs. per rupee. It is reserved specially as food for work cattle at busy seasons. The pulse is worth 45 to 55 lbs. per rupee according to season.

The fodder.

The following tabulated statement gives outturns and results from full average crops tested in different years in the Broach District :—

Seed rate per acre.	Outturn per acre.		Value of Outturn per acre.
	Pulse.	Fodder.	
Lbs.	Lbs.	Lbs.	Rs. a. p.
40	925	1,323	32 4 8
41	995	1,405	30 14 7
41	1,068	1,220	40 13 0

Cost of Cultivation.

	Per acre. Rs. a. p.
Three ploughings between June and September ...	2 8 0
Three harrowings, June to September	0 12 0
Sowing with plough and covering seed with *samár* ...	1 2 0
Cost of seed	1 0 0
Reaping, gathering and turning heaps of crop and carting to threshing floor	1 4 0
Threshing and winnowing	1 2 0
	7 12 0
Add—Government assessment ...	6 0 0
	13 12 0

VAL—Dolichos lab lab—Linn.

Natural Order—*Leguminoseæ.*

Sub-order—*Papilionaceæ.*

Tribe—*Phaseoleæ.*

Gujaráti, *Vál*; Maráthi, *Pávta*; Kánarese, *Avare.*

Origin.

Vál is found wild in India—its original home—and its cultivation is estimated as beginning 3,000 years ago.

General character of the plant.

Vál has a more twining and climbing habit of growth than any of the other common pulses. The leaves and young tissues are very cellular and soft, and the crop is, in consequence, often a prey to caterpillars and other insects. The flowers are in most varieties white, but purple in one climbing variety of vigorous habit of growth. The pods are rather flat, fairly broad, scimitar-shaped, tipped with the hardened base of the style, and contain three to five seeds which vary in size, shape and colour according to variety. The seeds are of three distinct types—(*a*) small, slightly flattened, oval; (*b*) large, full-bodied, rounded, oval; (*c*) still larger, flattened, oval. The usual colours of seed are white, creamy-white, kháki, pale brown, mahogany-red, brown, dark-brown, black or purplish-black. The hilum is pure white in all the Bombay varieties. The fodder of *vál*, when cut when the plants are in flower, is excellent for all farm animals.

Distribution in the Bombay Presidency.

The total area is about 80,000 acres annually. The most important centres of cultivation are the Surat District, the three collectorates of the Karnátak, Ratnágiri and Kolába. The crop is grown to a limited extent in all the other districts of the Presidency.

Varieties.

Numerous varieties of *vál* are cultivated in the Presidency. One variety—Surti *pápdi*—is grown extensively in garden land in the Surat District and as a vigorous climber in the backyards of the households. It has special value on

account of the tender, green vegetable which it yields. The beans are plucked early, and used like French beans. The variety grown in rice fields in the Surat District as a second crop is a bitter variety, called *kadva vál*. Another bitter variety with smaller pods is sometimes drilled with rice and *tuver* in unembanked fields in June-July in Southern Gujarát.

Rotation; mixtures; soils.

The principal crop is the *rabi* crop, and it usually is a second crop in rice fields. It is either sown alone or with the castor oil plant (the dwarf variety) occasionally in ordinary dry crop fields. *Vál* is sown among the other pulses subordinate to *jowár* or *bájri*. In the *bátha* (river side) alluvial land of the Tápti, *vál* (Surti *pápdi*), castors (large variety) and *tuver* are very common subordinate crops to *jowár*. When the *jowár* is reaped, a long stubble, 3 feet to 4 feet high, is left. This stubble with the vigorous growing castor oil plants and the *tuver* afford support to the climbing *vál*, and heavy successive crops of green beans are plucked between November and March. The soil is of sandy consistence, but the permanent water level is not far from the surface, and *vál* does not suffer in ordinary seasons from any lack of moisture. The more common crop grown in the *rabi* season in rice-beds requires soil of different consistence. The most suitable soil for the *rabi* crop is black soil or at least clay soil, very retentive of moisture and situated in a low-lying damp situation. In highly assessed garden land *vál* is sometimes taken as a catch crop when the opportunity occurs. It is sown as speedily as possible after the previous crop is removed, and, if this is done, the natural moisture in the soil is generally sufficient to bring the *vál* to maturity. A crop grown in this way has a restorative effect on garden land, and if the crop shades the ground, as probably will be the case, weeds are suppressed.

Cultivation of the Rabi Crop.

As soon as possible after the removal of the rain crop (usually rice), the land is ploughed and cross ploughed. The plough is again worked a third time, and the seed is then dropped into the furrows through a single seed tube attached to the plough. If *vál* is sown alone, generally the seed rate is 50 lbs. to 60 lbs. per acre. If *vál* and castor beans are sown together, the seed rate should be 40 lbs. *vál* and 10 to 15 lbs. castor beans per acre. The rough surface after sowing is generally pressed down with a plank roller or light log of wood. The crop gets no weeding or other attention until harvest time. It is fully ripe when the leaves turn yellow and drop off, and should then be reaped close to the ground with a sickle. Generally, beans are plucked previously as they ripen. If the field holds sufficient moisture to fully mature the crop, ripe beans may be plucked through a period of two months. A very good crop of *vál* after rice will yield 1,300 lbs. of pulse and an equal weight of useful fodder per acre. The average in the Surat District for all experiments up to 1896 was 658 lbs. pulse per acre. The pulse is worth 45 to 50 lbs. per rupee ordinarily.

Diseases, etc.

Vál is a delicate crop in many ways. It is on account of its tender tissues peculiarly liable to attack by insects, especially caterpillars. They destroy the foliage. A grub eats into the pods, and destroys the seeds. The crop is damaged by cloudy weather, the effect being that the flowers fall off, and the

fertilization is imperfectly completed. Cold is harmful and frost fatal. In the Surat District a practice prevails of growing a border of *san (Crotalaria juncia)* round the crop of *vál*. The *san* grows thick and tall, and protects the *vál* to some extent from cold.

KULTHI—Dolichos biflorus or *uniflorus*—Linn.

Natural Order—*Leguminoseæ*.

Sub-order—*Papilionaceæ*.

Gujaráti, *Kulthi*; Maráthi, *Hulga*; Kánarese, *Hulle*.

There are apparently two cultivated varieties :—

Dolichos uniflorus—Sub-erect.

Dolichos biflorus—Twining.

General character of the plant.

The plant grown in the Bombay Presidency has a fairly stout stem near the root. The branches are very numerous, and when no other support is afforded, they twine very promiscuously together. The foliage is very pale green, and, when young, is exceedingly tender in its tissues. The flowers are yellow, the pods are flattish, re-curved, 1 to 1½ inches long, and contain about six seeds. The seeds are shining, flattened, kidney shaped, and vary in colour and in size. One variety has fairly large purple-brown seed, another a smaller seed of the same colour. A variety grown sparingly in the Ahmednagar and Kaira Districts has creamy-white seed. The variety in commonest cultivation in India has grey, variegated seed.

An important crop in Madras.

The crop is a very important one in the Madras Presidency, where it takes the place of gram and is called horse gram.

Distribution in the Bombay Presidency.

Kulthi takes the third place among the pulses of the Presidency, and, according to statistical returns, occupies over 500,000 acres annually. It is, however, almost always a subordinate crop, generally occupying every fourth row, and the actual area over which this pulse is sown probably exceeds two million acres.

In Gujarát, Ahmedabad grows a small area. The cultivation is very important in the Deccan, particularly in the Khándesh, Násik, Ahmednagar and Sátára Districts. In the Karnátak, Belgaum and Dhárwár each grow 55,000 to 60,000 acres annually and Bijápur 20,000 acres. In the Konkan the pulse is only important in Ratnágiri.

Season; mixtures; soils.

The principal cultivation of *kulthi* in Bombay is in the *kharif* season as a row or mixed crop, subordinate to *bájri*. It is occasionally grown in the *rabi* season as a second crop in rice fields and sometimes alone or with rows of niger seed as a *kharif* crop. In Madras it is used as a green manure crop to some extent. It is very sparingly cultivated for the same purpose in Bombay. *Kulthi* is essentially a light soil crop, and is extensively grown on the light

red stony soils of the Deccan. It does well also on poor sandy soils. It only requires a moderate rainfall, and succeeds better than any other pulse in light soil which is in poor condition.

Cultivation in the Deccan.

Kulthi participates in the general cultivation given for *bájri*. The light soil fields in which *kulthi* is grown are rarely manured oftener than once in three years, and then only get light dressings. The land may be ploughed, but is generally prepared for sowing by working the heavy-bladed harrow (*vakhar*) two or three times in the hot weather and again two or three times after rain has soaked the soil in June. The mixed crop is sown in July, generally about the middle of the month. A four-coultered drill is used. The seed may be mixed before sowing, in which case mixed plants are found in all rows. Sometimes the *kulthi* is sown alone in every fourth row. A common seed rate for the mixed crop in light or medium light soil would be—

Bájri	...	...	6 to 8 lbs. per acre.
Ambádi (hemp)	...	...	1 lb.
Kulthi	...	...	1½ to 2 lbs.
Niger seed (*khurásni*)	...	...	½ lb.

Outturn.

The crop is generally bullock hoed twice with the *kolpa*, but is not usually hand weeded. A good outturn per acre of *kulthi* from the above seed rate in a favourable season would be 70 or 80 lbs. pulse. The crop, if sown in July, will be ripe at the end of October or early in November. The *bhusa* or chaff obtained from *kulthi*, when threshed under the feet of bullocks, is of very fine quality, and if the fodder is cut when the plant is in flower, it is excellent for all farm animals; but the weight of fodder obtained per acre is light. The pulse is usually cheap, about 50 lbs. per rupee, and when boiled is used to a considerable extent as food for farm animals.

The fodder.

CLUSTER BEAN—*Cyamopsis psoralioides*—D. C.

Gujaráti, *Guvár*; Maráthi, *Gavár*; Kánarese, *Chavlikái*.

Origin.

This pulse belongs to the tribe *galegeæ* of the papilionaceous division of the *leguminosæ*. It has never been found wild anywhere, and it is not known with certainty where it originated. One species of the genus is Indian, the only other African. It is cultivated in many parts of India.

Distribution.

In the Bombay Presidency it is a crop of very minor importance, except in Gujarát. In that province it is extensively grown. The statistical area returns for Gujarát show an annual acreage under this crop of over 20,000 acres, but as *guvár* is usually sown subordinate to other crops, it is actually grown over a much wider area than the statistical figures indicate. Experimental trials in the Deccan have proved that the plant grows much less vigorously there than in Gujarát.

Varieties.

Several varieties have been identified in the Charotar villages of Kaira and Baroda Territory.

I. *Pardeshi.*—A sprinkling is sown in *kodra* and other cereal *kharif* crops. In the fertile alluvial soil of the Charotar villages the *Pardeshi* variety grows about 6 feet high. The pods are gathered usually green and used as a vegetable. Two *Pardeshi* sorts are known—(*a*) *Khaguli*, with hairy leaves. This is considered a superior variety; (*b*) *Teliu*, with glabrous, oily-looking leaves. The seeds of both sorts have a yellow tinge.

II. *Sotia Guvár.*—This variety grows 8 to 10 feet high. The pods are used as a vegetable. The crop is extensively grown in the garden lands of Gujarát. It is sown amongst ginger to give shade. When the pods are plucked, the side leaves are stripped off, and left on the surface as green manure for the ginger. In the garden lands of Surat it is grown mixed with cucumbers, being sown usually in May and irrigated until the rains come. The seeds are yellowish in colour and small.

III. *Deshi* (sometimes called *boot*) is the common variety, with violet-tinged seeds, which is sown as an ordinary dry crop, subordinate to *bájri*, and grows to a height usually of 4½ to 5 feet or so. The seed and foliage are extensively used as cattle food in Gujarát, but the green pods are considered inferior as a green vegetable.

Soils suitable.

The plant does not thrive on very retentive soil. In fertile free working garden soils throughout Gujarát it grows well, and luxuriantly in the deep, alluvial, sandy loams of Northern Gujarát, particularly when such are worked as "garden" lands, and get the liberal treatment usually given to such.

In such land *guvár* is grown sometimes specially as a green manure crop. The seed is thickly broadcasted early in June. The crop may give some direct return in the shape of green pods for vegetables, but when it is in full vigour of growth, it is uprooted, the stems broken up, and the side leaves stripped off. The whole is placed as a litter on the surface and then ploughed in. *Guvár* is specially suitable as a green manure crop, not only because it belongs to the *papilionaceæ*, and therefore increases the soil's stock of nitrogen; but it is a herbaceous plant, comparatively free from crude fibre when young, and therefore rapidly decays in the soil.

MATH—*Phaseolus aconitifolius*—Jacq.

Natural Order—*Leguminosæ*.

Sub-order—*Papilionaceæ*.

Tribe—*Phaseoleæ*.

Gujaráti, *Math*; Maráthi, *Matki*; Kánarese, *Madaki*.

Origin.

This pulse is believed to have come into cultivation much more recently than other pulses cultivated in India. It is grown in all parts of India, but is not cultivated to any great extent in other countries.

General character of the plant.

This pulse can easily be indentified from the other pulses cultivated on account of its deeply-indented, aconite-shaped leaves and the trailing habit of the stems which branch and extend along the ground in all directions.

A well grown plant has stems 2 to 3 feet long. The flowers are yellow and small. The pod is straight, distinctly indented to form a compartment for each seed. Seeds five to seven in a pod, drab or light-brown or purple-brown, small, oblong.

Distribution in the Bombay Presidency.

This pulse is the fourth in importance in Bombay. The annual area is sometimes nearly 300,000, but varies to a considerable extent with the character of the season. *Math* is grown to a considerable extent in all districts except the Konkan.

The Deccan produces most, then Gujarát. The most important districts are Ahmedabad (50,000 acres), Kaira (25,000), Khándesh (20,000), Ahmednagar (40,000), Poona (28,000), Sholápur (25,000), Sátára (60,000). In the Karnátak, Dhárwár grows 12,000 acres and the other two collectorates less.

Mixtures; season; soils.

It is only grown as a rain crop. *Math* is a rarely, if ever, sown alone. It is a common, subordinate crop with *bájri*. It is, like *kulthi*, essentially a light soil crop, and gives its best outturn on the deep, alluvium sands or sandy loams of the Ahmedabad and Kaira Districts. In the Deccan Districts it is sown, like *kulthi*, mostly on light, stony, more or less upland soil and on such land does not yield nearly so well as in the fertile plains of Northern Gujarát. It manages to thrive, however, fairly well in soil which is in poor condition. Heavy rain is very harmful to this pulse. It does best with a well distributed rainfall of about 30 inches.

Cultivation in Gujará't.

Outturn value.

Cattle-food.

Math participates in the general cultivation given to *bájri*—the principal crop which has already been described. *Math* ripens after *bájri*, and is usually reaped in November-December. A fair yield in an average season would be 120 lbs. pulse per acre from a seed rate of 1½ lbs. The pulse is usually worth 40 to 45 lbs. per rupee. In Gujarát *math*, when ground into coarse meal, is used with cotton seed, oil cake, etc., as food for milch and work cattle.

MUG—(Green gram), *Phaseolus mungo*—Linn.

Natural Order—*Leguminosæ*.

Sub-order—*Papilionaceæ*.

Tribe—*Phaseoleæ*.

Gujaráti, *Mag*; Maráthi, *Mug*; Kánarese, *Hesaru*.

Origin.

Mug is a native of India, has been cultivated for at least 3,000 years, and is grown in all parts of India and also in Africa, particularly in the Nile Valley.

General character of the plant.

This pulse closely resembles *udid (Phaseolus radiatus)*. It is a hairy, sub-erect branching annual, with fairly large entire trifoliate leaves. The yellow flowers are crowded in a cluster. The pods are 2 inches or

more in length, and contain twelve or fewer seeds. The seeds are rounded, very slightly oblong, and, according to variety, may be very dark marbled green, pale green, brown, purplish-brown, or pale yellow-brown in colour.

Distribution in the Bombay Presidency.

This pulse is sixth in importance in Bombay. The statistical returns give an annual area of about 200,000. But *mug* is often sown as a mere sprinkling in *jowári* and other fields, and probably this sprinkling actually covers an area of perhaps 1½ million acres. The pulse is grown more in Dhárwár and Bijápur than in other districts. The other more important centres of cultivation are Ahmedabad, Khándesh, Ahmednagar, Sátára and Belgaum.

Season, mixtures, soils, etc.

In Dhárwár, Kolába and Kánara *mug* is grown in the *rabi* season as a second crop after rice. Its chief cultivation is, however, in the *kharif* season. As a *rabi* crop it is grown alone. As a rain crop it is grown subordinate to *jowári* and other cereals. *Mug* does best on deep good soil of fairly dense consistence, such as the *besar* soils of Gujarát or ordinary black soil. Soils which are suitable for *jowár* are also suitable for *mug*. The plant does best with a well distributed rainfall at about 30″ to 35″. Heavy downpours of rain are very disastrous to this pulse, particularly at flowering time.

Cultivation.

Mug, when grown in the *rabi* season as a second crop after rice is cultivated in the same way as *vál* (*see* description given). The seed rate is less than for *vál*, 15 to 20 lbs. per acre being sufficient. The preparatory tillage should also perhaps be more careful. *Mug* needs a fairly fine seed bed. In the Deccan this pulse is sometimes sown alone in the *kharif* season as a catch crop before sugarcane and other irrigated crops which are planted in the *rabi* season. The seed is drilled with a four-coultered drill at the rate of 15 to 20 lbs. per acre on well prepared soil. One hand weeding is given, if necessary. The pulse soon covers and shades the ground, and smothers weeds. It is either allowed to grow to maturity, or the pods are plucked and used as a green vegetable, and the fodder afterwards cut green. The crop is often attacked by caterpillars. The cultivation of *mug* as a subordinate crop has been already described under *jowári*. From a seed rate of 1½ to 2 lbs. per acre an outturn of 150 lbs. to 200 lbs. pulse per acre may be expected in a favourable season. *Mug* and its near relative *udid* are considered the best pulses for split *dál* for human food. *Udid* is perhaps generally considered best.

UDID—*Phaseolus mungo*. Var., *Radiatus*—Linn.

Gujaráti, *Adad*; Maráthi, *Udid*; Kánarese, *Uddu*.

General character of the plant.

This pulse resembles *mug* in general appearance. It is more hairy and the leaves are lighter green in colour. The pods are shorter and stouter than those of *mug*, and the seeds are oblong, rounded, larger than *mug* and dark brown, nearly black, slightly marbled in colour. The hilum is white. *Mug* and *udid* are near relatives, and are considered as belonging to one species. Both are cultivated all over India.

The statistical returns show that the area varies considerably from year to year according to season. It ranges from about 250,000 acres downwards. *Udid* is mostly grown as a subordinate crop with *jowár* and other cereals, and the actual area over which the seed is sown is probably four to six times the area recorded, the recorded areas being estimates of the actual areas which would be occupied if *udid* was the sole crop. *Udid* is a very important pulse in the black soils of Khándesh. It is also grown fairly extensively in Násik, Sátára, Belgaum, Thána and Ahmedabad. In other districts it is of minor importance.

Distribution in the Bombay Presidency.

Udid, like *mug*, is grown mostly as a rain crop, subordinate to *jowár* but also, like *mug*, is grown alone to a small extent in the *kharif* season and over a considerable area in the *rabi* season and chiefly as a second crop after rice. It thrives best under precisely the same conditions of soil, climate, etc., as *mug*, and the cultivation as described for *mug* is applicable to *udid* in all particulars.

Season, mixtures, soils, etc.

CHOLA—Vigna catiang—Endl.

Natural Order—*Leguminoseæ*.

Sub-order— *Papilionaceæ*.

Tribe—*Phaseoleæ*.

Gujaráti, *Chola*; Maráthi, *Chavli*; Kánarese, *Alsandi*.

Chola is a native of India, and is cultivated generally throughout the plains. Several varieties are known which differ in the colour of the flower, the colour of the seed and the length of the pod.

Origin.

Chola resembles *mug* and *udid* in habit of growth. The branches are, however, more climbing or twining, and the leaves and stalks are hairless. The flowers are borne in clusters at the top of the peduncle, and, according to variety, are either very pale blue or reddish-purple inside. The former are yellowish outside, and this colour is most observable as the flowers fade after fertilization. The peduncles are long, and so also are the beans. They are, therefore, easily seen in clusters of three to six above the level of the twining crop. This is particularly noticeable in a long podded variety grown by market gardeners as a green vegetable. The long straight pods are indented on each side, so that each seed occupies a separate cell so to speak. The seeds are numerous in each pod and are oblong-rounded. One Bombay variety has large pale yellow seed, with a purple margin circling the white hilum. Another variety is of the same colour, but the seeds are much smaller. A third variety has light purple seed with drab hilum. The seed of a fourth variety is dull yellow. A fifth variety has blue-black seed, with small dirty white hilum.

General character of the plant.

The cultivation of this pulse is not extensive. The total area does not exceed 25,000 acres annually. It is grown to the greatest extent in the Kaira, Khándesh, Belgaum, Bijápur and Thána Districts.

Distribution in the Bombay Presidency.

Chola does not yield so well as *mug*, *udid* and other hardier pulses as a subordinate crop with cereals under unfavourable conditions of rainfall and season. Its cultivation is, in consequence, restricted. It is grown with other pulses subordinate to *bájri* in light alluvial soils in the Kaira District. It does better in moderately light soil than in soil of heavier or denser consistence. It is grown alone in the *kharif* season in garden land to produce a green vegetable—so-called French beans—and in the *rabi* season is grown like *mug* and *udid*, to a limited extent as a second crop in rice fields. As a sole crop in the *kharif* season it grows rapidly, soon shades the ground with a thick mass of growth, which, if cut as green fodder, is excellent in moderate quantity for cattle, especially milk cows. The crop is liable to be damaged by caterpillars, the leaves when young being soft and tender.

Season; mixtures; soils.

Fodder.

The cultivation as described for *mug* is applicable to *chola*.

LENTILS—*Ervum lens or Lens esculenta*—Linn.

Natural Order—*Leguminoseæ*.

Sub-order—*Papilionaceæ*.

Tribe—*Vicieæ*.

Gujaráti, *Masur*; Maráthi, *Masur*; Kánarese, *Channangi*.

This plant is a native of Western Asia, Greece and Italy. It has long been cultivated in Egypt, and was brought from there to India, and is now grown as a cold season crop all over the country. It is specially important in the Central Provinces, Madras and North-West Provinces.

Origin.

This plant is the smallest of the Bombay pulses, and resembles gram (*Cicer arietinum*) in its habit of growth. The plant is more erect and more branched. It can be distinguished from other pulses by its tiny leaflets and its small two-seeded pods.

General character of the plant.

The flowers are pale purple in 2 to 4 flowered racemes. The seeds of the common variety are round, but flattened and purplish-brown, slightly marbled. A less common variety has large round very flat seed, slightly wrinkled and of the same colour as the common variety.

Distribution in the Bombay Presidency.

The total area is less than 20,000 acres. The crop is only important in Násik, Belgaum and Poona.

Masur is grown generally alone and always as an unirrigated *rabi* crop. In the Poona district it is the sole crop of the year, and is grown chiefly just under the eastern slopes of the ghats. It is there rotated with dry crop wheat. The district is favoured by heavy monsoon rains and usually with good showers in October and November. The soil is mixed black, but only of moderate depth.

Season; mixtures; soils.

The land is left uncultivated during the heavy monsoon rainfall. In September and October a plough is worked repeatedly until the land is clean and in fair tilth. The seed is drilled in October in rows a foot or less apart. The seed is small, and 20 to 25 lbs. per acre give a sufficient seed rate. The seed should not be deposited too deeply. Often a heavy log is drawn over the surface after the seed is sown to smooth the surface and press down the soil to conserve moisture. No hand-weeding or interculture is given. The crop ripens in 3½ months. A good outturn in a fair season from the poor "rabi" lands in which *masur* is usually grown will not exceed 300 lbs. per acre. No other pulse would thrive so well under the same conditions of soil and climate. The amount of fodder obtained per acre is small.

Cultivation.

SESAMUM OR GINGELLY OIL-SEED—*Sesamum indicum*—Linn.

Tal, Gujaráti; *Til* or *Tili*, Maráthi; *Yellu*, Kánarese.

This plant belongs to the natural order *Pedalineæ*. It is cultivated throughout the tropical regions of the globe, and is wild in the island of Java. Dr. Watt thinks it is indigenous in India.

Habitat.

Sesamum is an annual herbaceous plant which when well grown is 3½ to 4½ feet high. The stems are erect, but branch freely if the plants get room. The fruit consists of a four-celled capsule, oblong, quadrangular, and opens at the top. The seeds are numerous, oval, flattened, shining, and either white, grey, reddish brown, dark brown or black according to variety. They are smaller than linseed.

General character of the plant.

It is difficult to classify the varieties. There is very little difference between them in the appearance of the leaves, flowers, fruit or mature plants. The white-seeded variety of the Deccan matures about a month earlier than the black and a fortnight earlier than red-seeded variety if sown early in the monsoon. But this white-seeded variety is different from the Gujarát variety with similar seed. Experimental trials have proved that the white Deccan variety does not thrive nearly so well in Gujarát as the local white variety. Varieties with seed of any of the recognised colours thrive if sown alone or subordinate to other crop early in the monsoon on certain descriptions of soil, principally light soil. The same remarks apply to such crops as are sown in soil which is generally much heavier, midway between the *kharif* or *rabi* season or in the *rabi* season. The seed of the monsoon varieties will not, however, produce a satisfactory crop if sown in the *rabi* season, and the *rabi* varieties are equally unsatisfactory if sown in the monsoon. There is evidence, in fact, that, whatever the colour of the seed may be, a variety which is habitually grown on certain kinds of soil in a particular district, at a certain season may not thrive if tried in another district, even though the conditions of cultivation are not materially different. White *til* contains a larger percentage of oil than seed of darker colour, and the residue oil-cake is also believed to be superior.

Varieties and conditions under which different varieties thrive best.

Three varieties grown at the Poona Government Farm were found by Dr. Leather to have the following analysis :—

	White Seed.	Black Seed.	Red Seed.
Moisture	4·87	5·42	5·37
Oil	48·13	46·50	46·20
Albuminoids	22·50	25·81	21·03
Mucilage, etc.	14·05	9·06	15·87
Woody fibre	4·49	6·52	4·18
Ash	5·96	6·69	7·35
	100·00	100·00	100·00
Containing nitrogen ...	3·60	4·13	3·37
Do. sand ...	·37	·66	1·35

These varieties were sown in adjoining plots on the same day—21st June. They ripened as under :—

White Til ...	... 14th October.
Red Til ...	... 2nd November.
Black Til ...	... 19th November.

Distribution in the Bombay Presidency.

From 300,000 to 350,000 acres are grown in the Presidency annually. In certain districts *til* is chiefly grown as a subordinate crop, therefore the area figures can only be approximately accurate. It is an important oilseed in all districts of Gujarát. In the Deccan, Khándesh is the principal centre of cultivation. But Násik, Ahmednagar and Sholápur have also considerable areas. It is grown throughout the Karnátak, but to the greatest extent in Dhárwár. The Konkan areas are not extensive.

Soils suitable.

The *kharif* crop requires a totally different kind of soil to that found most suitable for the *rabi* crop. *Til* as a rain crop likes a sandy or light soil, whereas the crop which is sown in August-September or later grows best on black soil or on such soils as are retentive of moisture.

Cultivation in Kaira.

The Kaira cultivation is typical for the *kharif* crop. *Til* is there sown subordinate to *bájri* on *garádu* (sandy loam) soils. The other subordinate crops are the usual pulses and fibre plants. The *til* seed rate is ¼ lb. or less per acre. For early sowing, the black, brown or grey varieties are considered preferable to the white. *Til* participates in the cultivation given to the principal crop, and, if sown as early in the *kharif* season as is practicable, will be ready for harvest in September-October. A good outturn of *til* as a subordinate crop is from 80 to 120 lbs. per acre.

Cultivation of the *rabi* crop.

Til as a *rabi* crop is extensively grown alone on black or medium black soil. The rotation crops are cotton and *jowár*. In the *til* year there is a good opportunity of thoroughly cleaning the land during the early monsoon months, because *til* is not sown until September. A field for *til* should be thoroughly clean and, when such is the case, the crop is an exceptionally good rotation crop with cotton. The advantage of growing *til* is chiefly on this account and not because it is directly particularly profitable. The crop is not exhaustive. The field should be got ready by repeated ploughings and harrowings during June, July and August. This tillage should produce

a perfect state of tilth and at the same time a tolerably firm seed-bed. The seed should be drilled. In the Deccan a four-coultered drill is used and the rows are about 13″ to 14″ apart; ¾ to 1 lb. seed is sufficient seed rate. The seed is small, and, to secure even distribution, should be mixed before sowing with finely powdered dry cowdung manure or ashes. *Til* likes a firm seed bed. The seed should be sown shallow and covered lightly with a brush harrow made of *bábhul* branches. In sowing *til*, the iron shares should be removed from the coulters of the drill to lessen penetrating power. The seed germinates slowly and often irregularly unless the soil moisture is sufficient. Heavy rain after sowing is usually disastrous, and cloudy weather, when the plant is in flower, does harm. The crop only needs light showers and a retentive soil to bring it to maturity. It is, however, like some other oil-seeds, a delicate crop to grow. Superfluous seedlings should be thinned out and the crop hand weeded once and bullock hoed twice. If sown in September, the crop is ready in January. It is ripe when the leaves turn yellow and capsules get mottled with black spots. Sometimes patches in a field, especially if the soil is variable, ripen prematurely. Such patches must be harvested as they ripen. If the plants get over-ripe, the capsules open, and the seed is certain to be lost before the crop reaches the threshing floor.

Harvesting, threshing and winnowing.

It is best to harvest the plants by uprooting. They should, as they are uprooted, be shaken over a large cloth spread in the field behind the harvesters, and moved from time to time as required. Thus the seed from such capsules as have opened is collected. The plants should be bound into small bundles, and carted the same day or the following day to the threshing floor. The bundles should be stooked up on their root ends close together on the threshing floor. In the course of ten days or a fortnight the capsules will ripen and open through the effect of sun and wind. The capsules will empty themselves by inverting each bundle and gently beating it with a stick. This may have to be repeated once or twice at intervals of a few days, especially if all the plants were not equally ripe when harvested. In any case the threshing of the crop is an inexpensive and simple process. The winnowing or cleaning of the seed is not quite so easily accomplished. It is partly effected by means of wind in the ordinary way, but the seed being light requires a good deal of sifting or winnowing to clean it properly. This is done by a *sup* which, if deftly handled, will separate all small particles of dirt and other impurity.

Cultivation in Gujará't.

In the black soil parts of Ahmedabad or in similar soil in Broach and Surat the crop may be grown alone, but it is more common to have a mixed crop of *tuver* and castors or *tuver*, *til* and *chibdi* (a small cucumber). The mixed crop is drilled in September on thoroughly prepared soil. The rows are about 2 feet apart, and the plants are thinned out 8″ or 12″ apart in the rows. In an unfavourable season a field of *til* in Broach or Surat shows irregular germination and a patchy appearance. But when the season is favourable, the crop is very regular and level, and the outturn very satisfactory. The mixture of *tuver* safeguards the cultivator, because it is a hardy plant, and in the deep soils of Broach and Surat there is certain in any season to be sufficient

moisture in the soil to bring the pulse to maturity, even though the mixed crop is sown as late as October. The *chibḍi* is sown a seed here and there, and spreads rapidly between the rows of *tuver* and *til*, and yields successive crops of green cucumbers until the plants become yellow and exhausted. The cultivation, etc., of *til* in Gujarát is, except as regards points noted, identical with that already described for the Deccan.

In Khándesh a good crop yields from 320 to 360 lbs. per acre. The seed is usually worth from 15 to 18 lbs. per rupee, white seed being dearest. White *til* on account of its pure colour is prized for the preparation of sweetmeats. *Til* cake is worth 35 to 45 lbs. per rupee, and is an excellent feeding cake. That made from white *til* is sometimes eaten by the poorer classes. The oil is largely used in native cookery in all well-to-do households.

A crop experiment taken in the Surat District in 1895-96 gave the following outturn, etc., results from a good average crop:—

Seed rate.	Outturn of Oilseed per acre.	Value of Outturn.
lb.	lbs.	Rs. a. p.
1	372	25 13 3

In 1898-99 excellent crops of *til* were grown on the Government Farm, Surat, on good ordinary black cotton soil. The following are details of outturn and cost of cultivation:—

	Per acre. Rs. a. p.
Ploughing	3 12 0
Collecting stubbles of previous crop... ...	0 4 6
Sowing and covering seed	0 7 0
Seed—1½ lbs. *til*, 1½ lbs. *tuver*	0 2 6
Thinning and hand weeding	0 15 0
Interculture	0 4 0
Watching	0 10 0
Harvesting	3 4 0
Threshing and winnowing	0 11 0
Total ...	10 6 0

Outturn.	Per acre. Lbs.	Value. Rs. a.
Til	454	28 0
Tuver	11½	0 4
Tuver bhusa	23½	0 2
Total ...		28 12

LINSEED—*Linum usitatissimum*—Linn.

Natural Order—*Lineæ*.

Tribe—*Eulineæ*.

Alsi, Gujaráti; *Alsi* or *Javas*, Maráthi; *Agashi*, Kánarese.

Habitat.

The plant is found wild between the Persian Gulf and the Black Sea, and is supposed to be a native of that region. It is cultivated in India chiefly throughout the plains. It was introduced into India by the Aryans.

Economic uses.

In India it is grown entirely for its seed which is valuable on account of the oil extracted therefrom and because the residue oil cake is perhaps the most valuable cattle food which is known.

In more temperate countries the cultivation of this crop is undertaken chiefly on account of the value of its fibre which is known as flax. It is probable that the climate of the plains of India is unsuitable for the production of strong fibre from this plant, and therefore it is right to grow the crop for its seed only.

General character of the plant.

Linseed is an erect annual. When sown thickly in temperate climates as a purely fibrous plant, the stems do not and ought not to branch so freely as when with a much smaller seed rate the crop is grown for its seed. In India a mature crop stands 18″ to 24″ high. The stems rise from the ground some distance, and then they branch freely. A linseed crop in flower is, during December-January, a noticeable feature of the black soil districts, particularly in Khándesh. The delicate colouring of the pale blue shinning flowers, is very striking. The fruit is a capsule, and is agriculturally called a boll. It has ten divisions, each containing a single seed. These are, however, imperfect sub-divisions of five perfect cells. The capsule is sub-globose with a sharp apex. The seeds are smooth, shining, feel soapy or oily when handled, and are oval and flattened. The common variety is rich, mahogany-brown in colour, but a creamy-white variety is sparingly grown in the Bombay Presidency and to a considerable extent in the Central Provinces.

Distribution in the Bombay Presidency.

The total area in the Presidency is usually less than 260,000 acres. The dry crop *rabi* areas under linseed, wheat, gram and *jowár* are more or less interchangeable, depending on the character of the monsoon season and particularly on the late rainfall. There is very little linseed grown in Gujarát. Khándesh, Násik, Sholápur and Ahmednagar are the important centres of cultivation in the Deccan. Bijápur grows a large area and Dhárwár a fair area. In the Konkan no linseed is grown.

Soils; season; mixtures.

Linseed is only grown in the *rabi* season on deep moisture holding black soil, and is on such land rotated chiefly with wheat and gram as dry crops, sometimes with *rabi jowár*. Linseed is generally grown alone, but, as stated in the descriptions of other crops, may be a row crop, subordinate to dry crop of *rabi jowár*, wheat and gram. The special black soils of the Presidency which particularly suit dry crop wheat and dry crop gram are equally suitable for linseed. The very best class of soil is probably the deep black soil belt on each side of the Tápti in Khándesh, which may get flooded and sodden in the rains, but which retains moisture in exceptional degree in the fair season.

Cultivation.

Linseed is the sole crop of its year. The preparatory tillage should begin with one or two harrowings in the hot weather, be continued during the monsoon, and should be complete by the end of September. The land may be ploughed once, but the principal tillage is done with the harrow (*vakhar*). It will produce, if worked often enough, a clean, friable, thoroughly pulverized

seed bed by the end of September. In October the seed should be drilled at the rate of 10 to 12 lbs. per acre in rows about 1 foot apart. The seed should not be deposited too deeply, and should be lightly covered. If there is moisture near the surface in deep black soil sufficient to secure even germination, the crop will probably reach maturity without any mishap and without further rainfall. The field for linseed ought to be so well prepared that hand weeding should not be required. Interculture with a bullock hoe between the rows of delicate seedlings would usually be harmful, and is not practised. The crop in a good season ripens in February, and with a sickle is partly reaped near the ground, partly uprooted. The seed easily sheds from the dry plant. Therefore the crop, soon after it is reaped, should be carried to the threshing floor. When completely dry by exposure to the sun, the seed is easily separated by beating with a stick. The seed is winnowed by wind in the usual way. A good crop with full even plant on deep black soil will yield about 500 lbs. seed per acre, but the crop is precarious and often yields much less. Rain after sowing does usually more harm than good, and cloudy weather, when the plants are in flower, interferes with fertilization in a manner which is not understood. Linseed may, therefore, be considered a delicate crop, which in favourable seasons only is grown with particular success.

Diseases.

A species of rust which may or may not be identical with the rust of wheat attacks this crop. The effect is that, although the crop looks comparatively healthy at harvest time, the seed vessels are either empty or contain imperfectly filled seed.

Cost of Cultivation, Khándesh.

	Per acre. Rs. a. p.
Clearing stubble of previous crop	0 6 0
Harrowing three times in hot weather	0 12 0
One ploughing in rains	1 8 0
Four harrowings during monsoon	1 0 0
Manure once in three years, or, say, six loads per annum.	3 0 0
Drilling and covering seed	0 10 0
Cost of seed 12 lbs.	0 14 0
Harvesting, carting, threshing and winnowing a crop of 400 lbs. per acre	2 0 0
Total ...	10 2 0

Ireland and Belgium are the two great European flax-growing countries.

Linseed as a fibre crop.

The conditions which favour the production of the finest quality of fibre are :—

(1) Suitable soil and careful tillage.

(2) Early sowing.

(3) Proper seed rate.

(4) Harvesting the crop at the proper stage.

(5) The subsequent treatment in extracting the fibre.

The crop likes an alluvial soil of an open character, in good heart, deeply cultivated, well manured and thoroughly clean. The seed should

be evenly distributed either by broadcasting or drilled in rows which should not be more than 9 inches apart. Weeding is of special importance. The plant is more or less delicate, and is not able to hold its own if sown in land which is not free of weeds.

When grown as a purely fibre crop, the seed should be sown early. The growth of the plant is thus slower than if sown later, when the chill of spring has given place to the warmth of summer. The effect is that the slower vegetation of the spring months produces a stronger and more valuable description of fibre. A high seed rate is necessary to produce fibre having a long staple. If the plants come up thickly, they grow with straight slender stems, which only throw out branches near the top. The necessary seed rate is from 80 to 120 lbs. per acre—just ten times as much as that for a seed crop in Bombay. The stage at which the crop is harvested needs special attention. It may be pulled, when it has flowered, ten to twelve weeks after sowing. If harvested at this stage, the amount of seed obtained is small, but the quality and quantity of fibre obtained makes up for this loss. When the plant begins to change colour at the root, it is considered to have matured sufficiently to give the best results; but in order to get a fair quantity of seed from the crop without materially damaging the fibre, the crop is sometimes allowed to grow, until a selected capsule from a full grown plant shows on section that the seeds, though still of a deep green colour, have acquired some consistence. Then the crop is immediately pulled. The seeds ripen after the crop is harvested, but of course, are not so well developed as those of a fully ripe crop. The uprooted crop lies in the sun two or more days, is then tied into small sized sheaves which are stooked up in the field sufficiently long to be safely stacked, or they may be carried at once to the steeping vats. The methods employed in extracting the fibre could only be generalized here, and as elaborate accounts of the whole process are given in several standard works, they need not be particularized.

It is probable that the heat of India does not favour the production of as fine a quality of flax fibre as the more temperate climates of European countries do. Moreover, the amount of seed required (Rs. 5 to Rs. 6 worth per acre) would be prohibitive with ordinary cultivators, because the cost would be grudged for a crop which, at the best, is a speculative and precarious one to grow.

SAFFLOWER, OR WILD SAFFRON—*Carthamus tinctorius*—Linn.

Gujaráti, *Kábri, Kasambi*; Maráthi, *Kardai*; Kánarese, *Kusubi.*

In Gujarát *kábri* is the name given to the seed, whilst *kasambi* or *kasambo* are names applied to the crop or to the dye extracted from the petals of the flowers. In the Deccan the Maráthi name *kardai* is applied to the crop or the oilseed.

General character of the plant.

Safflower belongs to the *Compositæ*. It is an annual thistle-like plant, with stems 2½ to 3 feet high, which branch freely, particularly if the leading shoot is nipped off early. The flowers in large compact heads are either yellow, slightly tinged with orange or bright orange, yellow tinged with red. The fruit or oilseed is an achene, obovoid, angular, with a white skinning husk and dull yellow kernel.

Safflower has never been found wild. Its original home was probably India or Africa. It is also grown in Europe, extensively in the south of France, Spain, Italy, Southern Germany and Southern Russia. It is also grown in China and South America.

General distribution.

Two varieties are grown in Bombay—the oilseed variety, which has yellow flowers and thorny leaves; and the dye plant, which has reddish-orange flowers, and is much less thorny than the oilseed variety. It is probable that safflower, like brinjal, by high cultivation, becomes less spiny. It is frequently observed that plants which in a wild state are very spiny show a tendency to lose their spines under cultivation. (Watt.)

Varieties.

The cultivation of the dye plant is not extensive. It is confined to Gujarát and the Karnátak. Kaira is the most important centre of cultivation. The extent of cultivation and the use of the dye has declined during the last twenty years, aniline dyes having supplanted *kasambi* both in the English market and in India.

Distribution in the Bombay Presidency.

Safflower is the most important oilseed crop in the Presidency. The area is usually from 500,000 to 600,000 acres annually. The chief centres of cultivation are in the black soil *rabi* lands of Ahmednagar, Poona, Sátára, Bijápur, Dhárwár and Belgaum.

The dye plant is chiefly grown in the deep alluvium loams of Kaira and Ahmedadad, generally alone as a dry crop or as a sprinkling in barley fields.

Mixtures and rotations.

In the Deccan and Karnátak the oilseed plant is almost always a row crop subordinate to wheat, gram or *rabi jowár*, or it may be grown as a border round other crops on the headland in *rabi* fields. This border answers the purpose of a fence, as stray cattle will not trespass through its thorny leaves.

CULTIVATION OF THE DYE PLANT, KAIRA DISTRICT.

The land is generally lightly manured in May or June, and ploughed during the rains several times. The bladed harrow (*karab*) is used after the plough, and the field becomes clean and in good tilth by September. The seed is drilled in that month or in October in rows 18 to 22 inches apart. The seed rate is about 20 lbs. per acre. The crop should be intercultured with the bullock hoe twice or oftener as may be required. If the seedlings come up thick in the rows, they should be thinned out. The extent of thinning will depend upon the season. Rain rarely falls after the crop is sown, and the plants will have to depend upon the natural moisture in the soil. If this is sufficient and germination is even, the plants soon show considerable vigour of growth, and should then be allowed plenty of room to branch freely. The central shoot should be removed. Lateral branches are thus encouraged, and numerous flower heads are produced. The prunings and any seedlings which are removed in thinning the crop are used, like spinnage, as a vegetable.

The flowers appear late in January or early in February, and picking goes on for a whole month. Flowers are picked in the early morning and at least every second day. The flowers are easiest picked when in full bloom.

Picking the flowers and making the dye.

They lose their colour when exposed to the sun. Therefore, flowers in full bloom should be picked at once. The plants being thorny, the pickers protect their hands with leather gloves. The bloom during the first part of the month is brighter in colour and superior to that during the latter part. The plants, as they become exhausted, do not produce flowers of such brilliant colours as when in full vigour. Cloudy weather in the flowering season is harmful. The flowers drop off before they are in full bloom. The plucked flowers (corollas), after being kept for a day, are rubbed with *til* oil—a *tola* weight to a pound of flowers—and are then dried in the sun for three days. This is the practice in Gujarát, but it is known to produce loss of colour Drying should be done either by pressure or in the shade. When dry, the corollas are beaten into powder, sifted, and packed ready for market.

The Bombay dye inferior.

As a dye, Chinese safflower is considered superior to Indian and Bengal dye to that of Bombay, which is thought very poor.

The chemistry of the dye.

Safflower petals contain three colouring matters—two yellow and one red. The red, called carthamic acid or carthamin (C_{14} H_{16} O_7) is by far the most valuable. One of the yellows is soluble in pure water, and is separated through that means from the others. It has little value as a permanent dye. The second yellow is soluble, both in alkaline and acid solutions, while the red is soluble in alkaline, but not in acid solutions. These facts indicate the manner in which each can be separated from the others.

Value of produce.

Safflower dye cakes are sold in Gujarát at 2 to 2½ lbs. per rupee. These cakes are made from the pulp from which the comparatively valueless temporary yellow has been washed. These cakes contain carthamin, as well as the more permanent of the two yellows, and form the basis required to produce the various tints of yellow, orange, pink and red so common in native-dyed cloth.

When safflower is grown alone as a dye crop, a fair average outturn on well manured, good land would be :—

Dried Flowers per acre.	Seed per acre.
100 to 120 lbs.	400 to 600 lbs.

Outturn.

Two duplicate well manured plots on the Nadiád Experimental Farm gave each the following results in 1891-92 :—

	Plot I.	Plot II.
Date of sowing	10th October.	10th October.
Seed-rate	15 lbs.	15 lbs.
Local estimate of crop	Average.	Average.
Outturn per acre	Seed 960. Flowers 111½.	986. 115.
Value per acre	Rs. 53-10-4.	Rs. 55-2-1.

Cultivation of the Oilseed Crop in the Deccan.

Safflower, as already stated, is always a subordinate row crop in *rabi* fields of dry crop *jowár*, wheat or gram. It, therefore, participates in the general cultivation given to these crops, which has already been described. Usually three consecutive rows of safflower alternate with

9 or 15 or 21 consecutive rows of the principal crop. The safflower ripens after the principal crop. It is ripe when the stems and leaves take a yellow colour. The plants are partly uprooted, partly reaped with a sickle. They are made into heaps in the field, and a clod of earth put on each heap to prevent its being blown about by wind. After three or four days' exposure, the oilseed can be separated. A threshing floor is usually prepared in the field, and the oilseed beaten out with a stick, and subsequently winnowed.

The results of a crop test taken in 1890-91 in the Ahmednagar District, as tabulated below, are, I think, nearly average :—

Mixed Jowár and Kardai.

	Jowár.	*Kardai.*
Estimate in annas	16	16
Seed rate per acre	4 lbs.	1 lb.
Outturn per acre (grain)	664 lbs.	96 lbs.
Value per rupee	55 lbs.	43 lbs.

The oil and oil cake.

The seed under pressure yields about 25 per cent. of oil which has a clear straw colour, and is extensively used in cookery, as also in adulterating *ghi* and *til* oil. *Kardai,* groundnut and *til* mixed and crushed together furnish the sweet oil of the bazars. Safflower oilcake would be a much better food than it is for milk cattle, if the tough white husk of the seed (fruit) were completely removed. Very often, however, the oilseed is partly decorticated by rough grinding between stones, and the husk separated by sifting before being pressed for oil. Cattle have to get accustomed to the cake before they eat it greedily. It has an advantage over other edible oil cakes, in that it keeps free of mould and good for months, and, moreover, is usually cheaper.

NIGER SEED—*Guizotia abyssynica.*

Gujaráti, *Rámtal*; Maráthi, *Khurásni, Kárala*; Kánarese, *Gurellu.*

Habitat.

This plant is a native of tropical Africa. It is extensively cultivated as an oilseed in various parts of India.

General character of the plant.

Nigher seed belongs to the *Compositæ,* and is an erect annual herb with stems 3 to 3½ feet high when well grown. The plant branches freely when it gets sufficient room. The yellow flower heads are numerous, and are each about 1″ in diameter. The fruit is a black, shining achene.

Economic uses.

A clear, limpid, pale yellow, sweet oil is expressed from the seed, and is largely used for culinary purposes. The residue oil cake, though it has a black uninviting appearance, is one of the best oil cakes for milk cattle. It is, however, very hard, and should be broken into small fragments before it is used as cattle food. The seed contains from 41 to 43 per cent. of oil, and yields in the country *ghâni* from 30 to 32 per cent. of oil.

Distribution in the Bombay Presidency.

Gujarát grows a very limited area. The crop is of most importance in the Deccan, and is especially important in the Násik District. Bijápur grows a fair area. In the uplands of the Konkan the cultivation is fairly extensive.

Soils; mixtures; season.

The crop is a *kharif* one. It is sown in June or July, and reaped in November or December. It succeeds well on the shallow black and light soils of the Deccan, particularly if a seasonable monsoon is followed by favourable late rains. *Khurásni* is extensively grown in the uplands often on poor stony land, where it is, in rotation with the coarse hill, millets, the last crop taken before the land is allowed to lie fallow. *Khurásni* maintains a vigorous growth on light land in poor condition, if the rainfall is sufficient and timely. It is more commonly grown alone than any other of the oilseeds. The yellow patches of *khurásni* form in the Deccan a noticeable feature in the landscape during September and October. In the same district in *bájri* fields it is also a conspicuous row crop, and it is found growing round the borders of cereal fields in situations subject to cattle-trespass. Cattle do not care to eat it, neither will they readily stray through it to reach the more tempting *bájri*.

Cultivation.

The land is not often ploughed for *khurásni*, neither is it manured. The *vakhar* (heavy harrow), loaded with a large stone and drawn by four bullocks, is used several times in April-May. By this means 2 or 3 inches of the soil is brought into a fine state of tilth which, when the rain comes, forms a capital seed bed. The seed is drilled with a four-coultered drill in rows 11 to 13 inches apart; 4 to 6 lbs. seed per acre is a sufficient seed rate. The young seedlings, if they come up thickly, should be thinned out to give individual plants room. A well branched plant produces more seed than several straight unbranched ones. The *kolpa* (bullock hoe) should be worked to weed and loosen the soil, but otherwise the crop has to take its chance. When ripe, it is cut with the sickle, dried in the sun for a few days, and carried to the threshing floor, where the seed is flailed out with a long supple wand. The following tabulated figures show the result of careful crop tests taken in 1891-92. These crops were estimated as average:—

Seed rate.	Outturn of Seed per acre.	Value of Outturn.	Assessment.
Lbs.	Lbs.	Rs. a. p.	As.
3	279	10 5 0	6
9	264	9 11 0	6

GROUNDNUT, EARTHNUT OR PEANUT—*Arachis hypogæa*—Linn.

Natural Order—*Leguminoseæ*.

Sub-order—*Papilionaceæ*.

Bhoïsing, Gujaráti; *Bhuïmug*, Maráthi; *Bhaimug*, Kánarese.

Groundnut is an annual herbaceous plant with procumbent branching hairy stems which, however, turn up at their growing points. The leaves

are compound, and have four hairy oval leaflets which are slightly variegated in colour. The small yellow pea-like flowers are at first sessile. After fertilization, the receptacle elongates, and forces the ovary below ground, where the fruit matures 2 to 4 inches under the surface. The pod is irregularly bent and 1 to 2 inches long. It contains two to four seeds. The pericarp or husk of the ripe fruit is tough, leathery, drab grey in colour, and curiously wrinkled with irregular deep indentations. The seeds are light brown when harvested, but get darker in colour during storage. They are somewhat irregular in shape, being flattened where they fit against each other in the pod.

Groundnut is a native of Brazil. It has long been cultivated in India, in Africa and generally in tropical countries. In India the crop is most important in the Madras and Bombay Presidencies.

Distribution in the Bombay Presidency.

The annual area has of late years been variable with a tendency to considerable decline. In 1898-99 the total area was 88,000 acres—about half the area of some previous years.

Surat is the only district in Gujarát which grows groundnut, and its area is small. In the Deccan, the Sátára area is still the most important, though it has declined greatly within recent years. Considerable areas are also grown in Sholápur, Poona, Násik and Khándesh. In the Karnátak, Belgaum grows a fair area. In Dhárwár and Bijápur the cultivation is trifling. No groundnut is grown in the Konkan.

Soils.

The crop grows best in deep alluvial soil of sandy loam consistence, but in Bombay it is grown to a greater extent on mixed black soil. Such land under irrigation is capable of growing market garden crops. The depth of soil is usually 2 to 2½ feet with a pervious substratum of *murum* and decomposed trap which secures perfect natural drainage.

Rotations ; mixtures.

Groundnut is an important rotation crop in garden lands in the Deccan. It is rotated with sugarcane, irrigated wheat, irrigated *jowár*, potatoes, sweet potatoes, onions, chillies, gram, etc. In Surat the garden crops grown in rotation with groundnut are *surans* (elephant foot), ginger, turmeric, yams, sweet potatoes, potatoes, cabbages, onions, garlic, etc.

Groundnut is generally grown alone, but occasionally, as in Surat, it is a mixed crop with castors.

A good crop forms a mass of matted trailing stems which completely shade the ground and smother all weeds. The advantage thus gained, together with the ameliorating benefit which the soil receives by the growth of this and some other leguminous crops, make groundnut a favourite in the rotation practised in garden land. Among garden crops it occupies the important position which gram occupies amongst dry crops. The cultivation of groundnut is only undertaken by well-to-do cultivators, and is an indication of prosperity or easy circumstances.

Season.

The crop is generally sown early in the rains, and, if late rains are deficient, it is helped by two or more waterings. In the Deccan it is sometimes sown later, and then necessarily needs irrigation during the greater period of its growth.

Manure.

Sheep or goat manure applied either by folding the flock on the field or otherwise is considered specially suitable. The sheep and goats should be folded during the hot weather. If the land cannot be manured in this way, a heavy dressing (25 loads per acre) of ordinary well-rotted farmyard manure should be given in May, and evenly distributed over the surface before the first fall of rain.

CULTIVATION IN THE DECCAN.

The land should be deeply ploughed as soon as the soil has been soaked 6″ or more deep with early rain. It is afterwards worked to a fine tilth by the repeated use of the bladed harrow (*vakhar*). The seed is sown between monsoon showers when the soil is dry enough to be worked by a plough. Husked kernels are sown. The husk should be carefully removed by hand and a few days only before the seed is required. 40 to 50 lbs. of husked nuts are required to sow an acre. These nuts are dropped by hand 3 or 4 inches apart in the furrow made by a 2-bullock plough. Each furrow should not be more than 3″ deep. The seed is covered by the soil moved by the plough in making consecutive furrows. If the ploughing is carefully done, the rows are about 9″ distant from each other, and are straight enough to be bullock hoed. Another method of sowing is to use a four-coultered drill. A harrow is used to cover the drilled seed. After the plough, the wooden head piece of the harrow, with the blade and prongs removed, is used to level the surface.

The crop should be weeded twice. As soon as it shades the ground, no further attention, except watering, is required.

Irrigation.

The monsoon crop occupies the soil six to seven months, and in the absence of rain the land must be kept moist artificially. It is usual to give two to four waterings during the last two or three months. The land is, however, not laid out into beds for any regular system of irrigation. The water is simply led over the surface in the best way the cultivator can arrange.

Harvesting.

The crop is harvested, like potatoes, sometimes with a plough, but more often the field is dug over by hand with a light native pick.

A cultivator collects a large number of people—mostly women and children—and pays in kind. In order to expedite the digging, the haulms are previously reaped and removed. These, if not over-ripe and dry, form an esteemed fodder. The cultivation in the Surat District is described under that of the castor-oil plant.

Outturn.

A good crop on suitable land liberally managed will, on an average, yield from 3,200 to 3,500 lbs. of unhusked nuts per acre. These figures only apply to good land. The proportion by weight of unhusked nuts to those with husk removed is as 4 to 3. This is the rate after the nuts have been dried sufficiently for safe storage. They are usually sold unhusked, and are worth from 30 to 45 lbs. per rupee according to locality

and season. The nut is often dug for home consumption before the crop is dead ripe, and the seed is either eaten raw or parched.

The oil.

Groundnut is commercially valuable on account of the high percentage of oil which it contains. Senegal, Mozambique and other East African varieties contain in the kernels about 50 per cent. of oil. The Bombay and Madras varieties contain only 42 to 45 per cent. of oil.

In the hydraulic press mills of Bombay the seed is heated and crushed before it is pressed, but cold expression gives the best quality of oil. Pure groundnut oil is almost colourless with a very faint odour and taste. It is valuable in Europe for adulterating olive oil, and the darker coloured inferior kinds are used for the lubrication of machinery and other purposes. In India the oil is used in native cookery, for adulterating ghee and also as a lamp and lubricating oil.

Groundnut oil does not turn rancid quickly.

Oil-cake.

The residue cake is a very highly concentrated nitrogenous food, and in moderate quantity is excellent for milk cattle and hard worked bullocks, but being particularly rich in albuminoids, should be fed mixed with other food of a starchy nature, such as ground maize, ground barley, etc.

CASTOR OIL PLANT—*Ricinus communis.*

Natural Order—*Euphorbiaceæ.*

Tribe—*Crotoneæ.*

Gujaráti, *Diveli*; Maráthi, *Erandi*; Kánarese, *Audla.*

General character of the plant.

There are perennial and annual varieties of this plant. The annual varieties grown in the Bombay Presidency are very much smaller than the perennial varieties. The latter grow with great rapidity, and a year's growth produces a tree 15 to 20 feet high. The foliage branches and stems, according to variety, may be bright pale green, or green tinged with red, bright shining red, or bronze purple. Varieties with the latter description of foliage are often grown as decorative plants in gardens. The stems of the castor-oil plant are hollow; the leaves are large and deeply lobed. The flowers are monœcious, paniculate and terminal on the leading shoot and branches. The fruit is a three-celled capsule, having thorn like external excrescences, and contains three seeds. The seeds vary in size and in colour according to variety. They are oval, slightly flattened on one side, smooth, shining, and beautifully marbled with shades of pale grey, yellow, fawn and brown. One Bombay variety has large seed, black in colour, with tiny specks of white. The perennial varieties are chiefly grown along irrigation water channel on the borders of sugarcane and in highly cultivated market garden land, and a plant soon gains the dimensions of a tree. Perennial castors are easily cultivated and readily escape from cultivation, and consequently the plant is now found wild in many countries.

Habitat.

The castor-oil plant is chiefly found wild in Abyssinia. It is a native of tropical Africa, whence it spread to Asia and Southern Europe. In Asia it is cultivated in India, in the Indian Archipelago, in Persia, Arabia, China and Japan. It is grown throughout Africa, in Italy, the West Indian Islands, and Tropical America. The perennial varieties are killed by frost in cold countries.

Distribution in the Bombay Presidency.

In some years the area is as high as 180,000 acres, but has been as low as 84,000 within recent years. Surat, Ahmedabad, Dhárwár, Sholápur and Belgaum are the important centres of cultivation.

Soils; mixtures; season.

The plant does best in deep free working soil. The very best crops in the Presidency are produced on the *bhátha* (alluvial) soils which fringe the course of the Tápti in Surat. In these *bhátha* lands mixed rain crops of castors, *jowári, tuver* and *vál* are grown. The castor plants are 10 to 15 feet apart, and grow 15 feet high, and branch freely in a single season. In the alluvial garden lands of the same district a mixed crop of castors and groundnut is common.

In the sandy *goráddu* soils of Northern Gujarát a sprinkling of castors is usually found in the subordinate mixture (*kathol*) of cereal crops sown in the *kharíf* season. Wherever garden cultivation is practised, castors are grown. The crop is directly remunerative, and the shade which the plants afford to ginger, turmeric, sugarcane and many other crops is of value.

The *rabi* crop (a comparatively dwarf plant) requires soil of different character. A retentive clay soil or the soil of moisture holding rice beds are suitable. On black soil the *rabi* crop is generally sown mixed with *tuver, til* or with gram, and this mixed crop is generally the sole crop of the year. In this case the land is well fallowed during the rains, and he mixed seed is sown in September. In rice beds castors and *vál* or castors and gram are second crops sown in October or as soon as possible after the rice is removed.

Cultivation of the Rabi Crop in Rice Beds.

The land, immediately after the rice is harvested, is ploughed twice, and levelled with the plank roller. The seed of *vál* and castors or gram and castors is mixed before sowing, and dropped through a single tube fixed behind a plough. The plough makes furrow after furrow, and the seed dropped into one furrow is covered by the soil moved in making the next. The surface is levelled with the *samár*. The seedlings come up in irregular rows about a foot apart. A seed rate of 40 to 50 lbs. *vál* and 10 lbs. castors is required per acre.

Superfluous castor seedlings are thinned out. If the soil holds plenty of moisture, the seedlings are thinned 2 or 3 feet apart, and the gram or *vál* plants are all left. A good crop of *rabi* castors grows to a height of 4 or 5 feet, but when moisture is deficient, the plants grow much smaller, and are not more than 18″ to 2 feet high. A crop sown in October-November ripens in February-March. In harvesting the crop the bunches of capsules are cut off in the field and spread on the threshing

floor until quite dry. The seed is separated by beating with a stick. The stems are used for fuel, and cattle will eat the leaves.

The following figures show the results of a crop experiment on castors after rice grown in Broach in 1891-92. The results may be taken as average for black soil in a fair season :—

Seed rate in lbs.	Date of Sowing.	Date of Harvest.	Outturn of Seed. Lbs. per acre.
33	October.	Early March.	525

The oil was extracted from the above quantity of seed, and was thereafter boiled to purify it for three hours. The result was—

201 lbs. of purified oil.
286 lbs. of oil-cake (*khol*).
38 lbs. waste.

In the previous year a crop test gave results as tabulated below :—

Outturn of beans per acre...		455
Oil extracted therefrom		178
Khol (oil-cake)		246⅜
Value of oil	Rs.	23-7-0
Value of *khol*	„	2-8-0

Castors have been grown alone for some years on the Nadiád Farm. The land is deep sandy loam. It is well cultivated during the rains, and the seed is drilled at the rate of 10 lbs. per acre in rows 4 feet apart in September. The other crops of the rotation are manured, but not the castors. The crop is intercultured repeatedly with the bullock hoe (*karabdi*) after the seedlings are a few inches high. The crop usually ripens in February. The best outturn obtained was 1,390 lbs. beans per acre, and this was in a specially favourable year.

Cultivation of the Kharif Crop.

The perennial variety is hardy, and its vigorous habit of growth helps it to succeed in any fairly deep soil. It, however, does best on rich garden land, freely manured and watered.

The Surat castor-groundnut mixed crop is taken to illustrate the cultivation of the *kharif* crop. Old farmyard manure at the rate of 15 cart-loads or more per acre should be given and spread in May. In June the land should be ploughed and harrowed repeatedly, and got into fine tilth. If by means of irrigation this can be done in May, so much the better. The land is now laid out for irrigation into beds; 12 ft. by 8 ft. is a common size. In the beds the groundnut seed is dibbled in twos about a foot apart between holes. Castor seed is dibbled in twos 9 feet apart along the *bándh* which divides two lines of beds. Thus the castor plants are 9 feet apart in one direction and 8 feet apart in another. Hand weeding is required until the groundnut shades the ground. The crop requires no further treatment except irrigation every ten days after the rains cease. Successive crops are got from the castors. The first fruits ripen in December. Afterwards the bunches of capsules should be plucked as they ripen. The plants grow to a height of 10 to 14 feet, and are in bearing for several months.

A subordinate crop of castors of the above class grown under irrigation at the Surat Farm yielded 767 lbs. beans per acre, worth Rs. 43-14. A good groundnut crop with the castors would yield 2,500 lbs. nuts per acre.

Oil and oil-cake.

The oil from castor beans is largely used for lighting purposes, and to a considerable extent as a lubricating oil by railway companies and others. The oil-cake is not edible, but is one of the most concentrated manures, known to the native cultivators, and is largely utilized as such in garden and sugarcane cultivation. It is worth in the Deccan 50 lbs. per rupee, whereas in Gujarát it can now (1900) be got at 80 lbs. per rupee. In former years it was much cheaper. In the Deccan the Kunbi prepares the oil at home. The seed is first baked, then crushed in a mortar. The crushed seed is boiled in water, and the oil is skimmed off as it rises.

SUGARCANE—*Saccharum officinarum*—Linn.

Natural Order—*Gramineæ.*

Tribe—*Andropogoneæ.*

Us, Maráthi; *Sherdi,* Gujaráti; *Kabbu,* Kánarese.

General character of the plant.

This is a perennial grass, 8 to 12 feet high, with thick solid jointed juicy stems. Leaves very long (3 to 4 feet) and 2″ to 3″ wide. Leaf sheaths about a foot long. Lower leaves die down long before the crop is ripe. The inflorescence is a large, graceful, feathery, terminal plume. Some varieties flower regularly, others rarely. The seed or fruit seldom forms.

Habitat.

It is uncertain whether the plant has been found in a wild state in any part of India. It is cultivated through tropical and sub-tropical Asia and the Islands of the Indian and Pacific Ocean and in other tropical parts of the world.

Distribution in the Bombay Presidency.

The Bombay area is about 60,000 acres annually. Sátára, Belgaum, Poona and Násik are the chief centres of cultivation.

Cultivation.

The crop is cultivated in almost all parts of the Presidency and on a greater variety of soils than any other irrigated crop. It adapts itself to almost any description of soil if drainage is secured by a pervious sub-soil or by artificial means. A water-logged condition of soil is perfectly fatal to successful cane cultivation.

Soils suitable.

In other respects any description of soil of fair depth suits one or more of the many varieties cultivated throughout the Presidency.

Different types.

The varieties may be broadly grouped into two types, but there are numerous gradations between the two extremes :—

(A) Thick, juicy, soft kinds which ordinarily require copious irrigation frequently given.

(B) Thin, very hard, less juicy kinds which require lighter irrigation at longer intervals.

General distribution of the crop in the Presidency.

On the very light alluvial soils of Ahmedabad and of Bassein and elsewhere on the Thána Coast and on the richer *alluvial loams of the* garden villages of Kaira, Baroda and Surat, excellent crops of varieties of "A" type are grown. These lands are almost continuously irrigated from wells, and the cane is rotated with other garden crops, such as ginger, turmeric, elephant's foot (*suran*), yams, potatoes, sweet potatoes, groundnut, plantains and betel-vines.

Cane in Gujarát.

In the Surat District sugarcane is not confined to soils of the above description only. It is also grown on black soil, slightly tinged with brown, about 4 feet deep, with a deep substratum of yellow earth which consists of an intimate mixture of sand, clay and lime. The sub-soil is fairly pervious to water. Cane is planted in such soil in artificially embanked fields which also grow rice, or on higher drier land; but in either case there is always an interval of several years, usually four to six, between two successive cane crops. Thick soft and thin hard varieties are often grown mixed on such land. It is not clear what advantage there is in growing the two kinds mixed except when a border of a thin hard variety on the headlands surrounds the soft succulent variety. In this case it is currently believed that less damage is done by jackals and pigs. These pests are supposed to sample the hard cane on the headlands, and, finding it hard or not very sweet, they pass on to a field with a soft succulent variety. Very often the two types are mixed indiscriminately all over the field. The same practices are also common in the Southern Marátha Country. The Surat District has great variety of soil and considerable range in the average rainfall between *tálukas*. It is therefore not surprising that eight distinct varieties of cane should be found in general cultivation, and at least six of these are different from any found in the Deccan or the Southern Marátha Country, and two are so distinctively coloured that they cannot be referred to any type found in other parts of the Presidency. These colours in each case can best be described as dirty.

Cane in Southern Marátha Country.

In the Southern Marátha Country cane is grown to a large extent on the favourably situate low-lying brown or red-brown laterite soils which also grow rice, and, where good perennial irrigation facilities exist, also grow many other garden crops. On this class of land, also on medium black soil, cane is grown at intervals of three to five years. A cane of peculiar colour is here in common cultivation. It has alternate longitudinal stripes of purple and green. Similar cane is sparingly cultivated in Khándesh and in the Nira Valley (Poona District), but not elsewhere in the Presidency as far as I know. In the Southern Marátha Country the general style of sugarcane cultivation is not so advanced as in some districts.

Cane in the neighbourhood of Poona.

The most suitable soil for cane in the neighbourhood of Poona is black or mixed black, got from decomposed trap. It is a stiff clay loam, 2½ to 3½ feet deep, resting on *murum*, which is shaly limestone very pervious to water. This combination of soil and subsoil secures good natural fertility, associated with good natural drainage. Only one variety of cane—"pundia"—is grown near Poona. It is a particularly good variety,

and possibly few, if any, other varieties cultivated in other districts surpass or equal *pundia* for the production of *gul* or crude-sugar. The cultivation of *pundia* is rapidly extending in other districts.

Period of growth.

Sugarcane is commonly called a twelve-months' crop. Some varieties ripen earlier than others. A crop which has been heavily manured with a quick acting manure may be forced to maturity in perhaps eleven months, whilst a crop treated with a slow-acting manure may take twelve or thirteen months to ripen. Again, a crop which is repeatedly top dressed with manure continues to grow longer, and probably also yields better than a crop grown with the same amount of manure applied entirely before plantation. Ratoon cane ripens in less time than newly planted cane. In the neighbourhood of Poona cane planted late in March or early in April under canal irrigation is often allowed to stand over two monsoon seasons or for eighteen months. Very often this practice pays, because, although the cane deteriorates, the extra price that *gul* brings (usually 50 per cent. more than in the ordinary season) more than compensates for the loss. The extra charge for canal water is not much, and there are no other extra expenses worth considering.

Seasons of planting.

Cane is planted in different localities at different seasons. In Ahmedabad, Kaira and Baroda, it is planted in May or early in June. The soil is of sandy character. White ants are very destructive on this class of land, particularly whilst the cane is young. The white ants do not do much harm during the monsoon to sugarcane, because on dry crop areas there is much vegetable growth at this season, which supplies the white ants with food, and the pest being widely distributed over large areas, the damage done is not particularly noticeable; therefore, if the cane is planted in May, it practically escapes damage whilst young. In the Surat District, also in the Southern Marátha Country, most of the cane is planted in November and December, but the season may extend to February. In the Poona District, February and March are considered the best months to plant. The season of planting depends somewhat upon local conditions. Generally speaking, any season is suitable for planting except the hot weather. Young shoots suffer considerably from the hot sun, and a check received at this time from this cause or, in fact, from any cause, is not afterwards recovered.

Propagation and methods of planting.

The crop is propagated from sets, sometimes, as in Gujarát, by planting whole canes. The sets consist of pieces of cane, generally about a foot long. Each set has usually three eye buds, sometimes more, and then the set may be 15″ to 18″ long. When sets are planted, beds are generally previously formed. The sets may be planted at the required distance apart in pits dug out with a small pick and 3 to 4 inches deep. One set is planted in each pit. The pits are in straight rows. The sets, when carefully covered with soil, are 4 to 6 inches apart in the rows and the rows 2 feet distant from each other. The beds are left level. This practice is common in Baroda. Water is given immediately after planting. Sometimes three or four sets are planted together in a pit, each pit being about 6″ deep and 12″ to 15″ square. The pits are about 2 feet apart from centre to centre. The cane then grows in clumps which stand up well in heavy wind or rain, and which, if bound round by dead leaves, are

not easily much damaged by jackals or pigs. The beds in which the clumps stand are left level. In the Southern Marátha Country it is customary, after the field is well prepared and manured, to plough it into ridges and furrows and, after watering, trample in the sets in the furrows. When the soil dries, the harrow or light plough is used to level the ridges over the planted sets and to work the land smooth and friable, so that, when the cane sends up shoots, these may be earthed up with the plough which is worked between the rows, and forms furrows which serve as water channels for temporary irrigation. Subsequently, beds are formed for regular irrigation, but in the case of hard varieties of cane requiring little water, the surface is left level, the rows not being earthed up, and the irrigation water is led over the field in the best way the cultivator can. This is not a desirable method, but when adopted in order to economize irrigation water as much as possible, grass is spread over the surface, and a fine layer of earth is put on the grass. This conserves moisture, and therefore fewer waterings are required. In the Dhárwár District the following is a common method of planting. Cane sets are put in furrows which are made by the plough. The sets are placed 3″ to 6″ apart, and are 12″ to 15″ long. Planting is done in February. The field is immediately watered. It is not laid out in beds at all. About a handful of manure is put over each set at the time of planting. When the soil dries after the first watering, the ridges are split with the plough. This is done before young shoots spring up. The sets now occupy the ridges, and the furrows serve as water channels for irrigating the crop, and extend along the least slope, generally either the whole length or breadth of the field.

When whole canes are planted, a heavy plough is used. The canes are passed through a hole drilled in a slanting or inclined backward direction through the body of the plough, and are left imbedded in the soil in the furrow and about 6 inches deep. This operation is facilitated by a man following the plough and trampling each cane into the furrow as it is pushed through the hole in the plough. The seed rate is calculated in lengths of 6 *háths* (about 9 feet); about 2,500 6-*háth* lengths are planted per acre. Very few single canes are each 6 *háths* long. This method of planting is of doubtful advantage for various reasons. It is slow. The cultivators of the districts, where this method is practised, think it is most expeditious; but this conclusion is wrong. Many of the eye buds are destroyed in passing the cane through the plough. Planting is commonly done in this way on black soils in the Surat District. If the plough is carefully guided, the rows are moderately straight, and are about 20 to 24 inches apart. After planting, the surface is smoothed and made into temporary shallow beds, and enough water is given literally to swamp the field. As soon as the soil dries, the light plough is worked to stir the surface soil to a depth of about 3 inches. The sets are planted below this level, and are not disturbed by the light plough. This light ploughing may be done twice. It kills weeds, and leaves the surface soil loose and friable, so that when the rows of young shoots are well up, they can be earthed up, and beds can be easily formed in the ordinary way for regular irrigation. The second watering is not given for six weeks or two months after plantation, and generally not more than twelve to fifteen waterings are given during the year and in artificially embanked land only nine. Deep black soil is, of course, very retentive of moisture, and the cane,

being planted deep, is favourably placed for moisture; still the practice of withholding water for a period of two months after plantation is by no means common. It is generally conceded that at least the soft succulent varieties of sugarcane on almost any class of land, if grown from sets, require frequent light irrigation until the young shoots are well up.

Deep planting advantageous.

There is no doubt that there is considerable advantage in planting cane deep, except on very retentive soil. If planted deep, the roots get a firm hold of the soil, and the canes are more or less supported, so that a heavy crop is not likely to be lodged by rain or wind. If planted deep in dense heavy soil, germination is interfered with; at least cane will not germinate evenly if planted in this way on such land.

The Mauritius system of planting.

The Mauritius system of planting is, I believe, advantageous on any description of moderately free working soil. In this system pits, a foot, sometimes more, in depth, are dug about a yard apart in each direction. 2, 3 or 4 sets are planted in each pit and covered carefully. If the pits are deep they should not be filled up level with the surface until the young shoots appear above ground. Beds are formed for irrigation. Recently introduced Mauritius varieties do well when planted in this way, and it is probable that such Indian varieties as freely tiller would also succeed; but experimental trials are necessary.

Cane usually grown at intervals of several years.

In most districts of the Presidency sugarcane is rarely grown on the same land at shorter intervals than four to six years. Nowhere, except in the Poona District, is cane grown continuously for several years, and in no other district is ratooning practised to any appreciable extent.

Ratoon cane.

A ratoon crop is one grown from the root stocks of the previous crop. There is clear evidence from the experiments at Mánjri that it is risky in the Poona District to take more than one ratoon crop. If new cane is planted on clean land, as of course it ought to be, there is little difficulty in keeping the new cane free of weeds particularly if the crop is heavy. It is not so easy to keep the succeeding ratoon crop quite clean. In the third year it is well nigh impossible, however careful the tillage may be, to prevent *harialí* (*Cynodon dactylon*) and other grasses and weeds becoming more or less established. The young shoots of the second year's ratoon come up weaker than those of the first year. The root stocks of the former get overgrown to the extent that the distribution of irrigation water is interfered with. Throughout the Poona District two successive ratoon crops are generally taken. The first ratoon crop gets generally a lighter dressing of manure than new cane, and the second ratoon crop gets a much lighter dressing, sometimes none at all. It is quite likely that residues of heavy dressings given to new cane and the first year's ratoon would suffice for the second ratoon crop without any direct application. Ratoon cane grown in this way would probably pay, even though a poor crop, because the cost of manure is by far the heaviest item in the cost of cultivation. On the other hand, deep-rooted grasses and other weeds might get thoroughly established. The cost of cleaning and fallowing

would be heavy. The profit from first ratoon is greater than from new cane. The preparatory tillage for the former is trifling. There is no expenditure for sets or for planting. Less irrigation and less manure is required.

I tabulate below outturn, etc., results from first and second year's ratoon grown on comparative plots at Mánjri (Poona). The plots were equally manured to secure fair comparison. Rather heavy dressings of manure were given. In ordinary practice less manure would probably have been given to the first year's ratoon and certainly to the second year's crop.

First Year's Ratoon.

Manure.	Weight of Manure per acre.	Weight of Cane stripped and topped per acre.	Outturn of *Gul* per acre.	Cost of Cultivation per acre.	Value of Produce per acre.
	Tons.	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.
Safflower and groundnut cake	3·3	68,030	7,680	320 10 0	426 10 0
Poudrette	22·65	73,580	8,055	324 14 0	447 8 0

Second Year's Ratoon.

Safflower and groundnut cake	3·3	38,510	4,095	292 4 0	227 8 0
Poudrette	22·65	34,530	4,040	301 14 0	224 7 0

Possibly, if a much lighter dressing of manure had been given to the second year's ratoon as in ordinary practice, the crop would have paid fairly well.

Cultivation in the Poona District.

Cane is grown almost continuously under canal irrigation in the Poona District. Occasionally the land is fallowed and rested for a few months, and, when thoroughly clean, a green manure crop of *san* (*Crotalaria juncia*) is grown and ploughed in. This crop is everywhere recognized as a good preparation for sugarcane. A green manure crop of *kulthi* (*Dolichos uniflorus*) is also considered in the Deccan a good preparation. Groundnut before sugarcane is considered good practice if the groundnut is well manured. The cultivation of sugarcane in the neighbourhood of Poona is perhaps typical of what it should be elsewhere, and may therefore be fully described. The best soil is a clay loam, and the best preparatory crop is a green manure crop of *san*. The *san* should be sown thickly in June or July (about 70 lbs. seed per acre), and ploughed in when 3½ to 4 feet high. The crop, if thick, smothers surface weeds. It enriches the surface soil with a mass of organic matter which quickly decays, and therefore leaves the soil open and friable, so that subsequent tillage operations can be done quickly and well. If no green manure crop has been grown, the land is allowed to lie waste during the monsoon. This is objectionable, because grasses and other weeds get established, and subsequent tillage and cleaning operations are expensive. The field is deeply ploughed

in November with a large eight-bullock plough, an acre being covered in about four days. The soil is turned up into huge clods, and is allowed to weather before it is cross-ploughed. One or two subsequent ploughings in December improve the tilth considerably. Most of the clods break up into smaller nodular pieces, and the soil becomes easily moved to a depth of about 10 inches. I may note that I have been able to accomplish the ploughing operations for sugarcane with Ransome's Turn Wrest plough quite as effectively as with the best pattern of indigenous plough and at considerably less cost for manual and bullock power. I advocate the use of the Turn Wrest plough for sugarcane and other garden crop cultivation; but for ordinary dry crop cultivation I cannot conscientiously urge that this plough or any other iron turn-furrow plough is as good as the best indigenous implements. After thorough ploughing the surface is levelled with a log harrow, and clods are broken, if necessary, by hand with a mallet or thick short stick. Then manure is applied. Poudrette or farmyard manure is most commonly used in the Poona neighbourhood, 60 loads, or, say, 30 tons, of either per acre being the usual dressing. If so much is given before plantation, the crop gets no top dressing afterwards; but usually a smaller application of poudrette or farmyard manure is given before plantation, and the crop is top dressed in June or July with castor cake, *karanj* cake, fish manure or other concentrated manures.

Nitrogen in immediately available form necessary for cane in the early stages of growth.

It has been proved by the Mánjri experiments, which will be referred to in detail further on, that certain manures are more active and effective for sugarcane than others, and that apparently the most important constituent of manures for sugarcane is nitrogen in immediately available condition. The experiments clearly indicated, if they did not absolutely prove, that nitrogen in this form was absolutely essential to feed the young shoots during the early stages of growth. The sugarcane set itself contains very little on which the young shoot can feed. Therefore, in the case of land in low condition the manures to be applied before plantation should be such as are known to be quick-acting, as, for instance, poudrette, fish manure and the various country-made oil cakes. Farmyard manure, which has the reputation of acting slowly if used, should be thoroughly decayed before application. In this condition it will probably act more effectively and quickly.

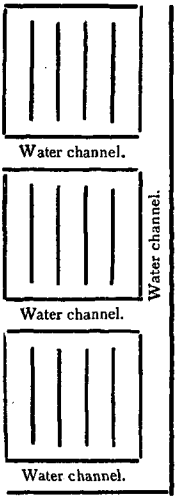
What is the most economical dressing of manure for cane.

It has yet to be proved what is the most economical dressing of nitrogen that should be given to produce the best results. Dr. Leather has shown by analysis that even a heavy crop of sugarcane does not take up more than 100 lbs. of nitrogen per acre, yet if all the manure is applied before plantation, as it ordinarily is in common practice, at least 400 lbs. of nitrogen per acre must necessarily be given for the best results. To provide this quantity of nitrogen, probably about 30 tons per acre of ordinary cowdung and compost manure would be required. If this application contains the required quantity of nitrogen, it will certainly contain sufficient of other important elements of nutrition.

Top dressing recommended.

There can be little doubt that the copious irrigation necessary for sugarcane washes manure away in the drainage. Dr. Leather has proved by analysis that during the process of the manurial experiments at Mánjri the soil has accumulated fertility, and that manures not removed by the

crops are still to a large extent in the soil. There was evidence of this in 1897. The whole comparative manure area was rested for a season, and on all the plots as well as on the pathways between plots a catch crop of green fodder was grown. On almost all plots the growth was very luxuriant, and the exact limits of each plot could be seen at a glance. The pathways between the plots grew in every instance only a middling crop. These pathways received practically the same tillage as the plots during the previous three years, but got no manure. The mere fact that so much nitrogen is given in the manure and so little is taken up by the crop suggests the idea that it would be far more economical to apply a smaller dressing of manure in repeated top dressings. This is practicable as regards concentrated manures like oil cakes, but is hardly practicable in the case of bulky manures like farmyard manure and poudrette, etc., because of the difficulty of spreading evenly a bulky manure on a crop which has grown so that it completely shades the ground. The whole question requires thorough elucidation by experiment.



Method of applying manure and subsequent tillage.

Poudrette or farmyard manure should be deposited in heaps regularly over the field, three or four heaps from one cartload. The manure should be evenly and carefully spread. The land should now be ridged up with the plough into ridges 24 to 28 inches apart, the furrows being as deep as possible. The plough should then be run across the line of ridges to form parallel water channels 10 feet apart. Finally, the field should be laid out into beds 10 feet square. The *bándh* round each water compartment should be raised by soil moved with the hand hoe from the furrows and by removing about 9 inches from the ends of each ridge inside any particular water compartment. Each compartment when complete contains four short ridges and five furrows, as shown in the marginal diagram. The thick lines indicate the crests of the ridges.

Planting.

The planting operation proceeds very methodically. One acre of good cane provides sets sufficient for eleven or twelve acres. Ratoon cane usually provides the best sets, because the joints or nodes are close together. Usually the sets got from the top end of the cane are longer than those from the base, because the nodes of the former are farthest apart. That portion of the cane nearest the green top is considered suitable for planting. Some authorities consider the "tops" better for sets than any portion of the mature cane. There is no doubt that the tops when used as sets root quickly, and the central shoot springs into growth very quickly, and the germination is therefore very regular and satisfactory; but it has yet to be proved whether the resulting crop is better or worse than from ordinary sets planted in the ordinary way. Each set from the top end would be

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quite a foot long, whereas from ratoon cane the sets would not be more than 8 inches long on an average. 16,000 to 18,000 sets are required per acre in the Poona District. The sets are carried in head loads to the field to be planted and laid along the ridges and on the *bándhs* of each water compartment. Water is turned into each bed in turn. When the water has partially soaked into the soil and softened it, the planter begins to lay the sets carefully in the bottom of the furrows, trampling each set down 3 or 4 inches into the soft mud. The distance between sets is about 4 inches. Planting in the Poona District should be done, if possible, in February, and certainly finished before the middle of March.

Application of concentrated manure.

If a concentrated manure is used, it should be applied after the beds are formed and before the sets are planted. It should be broadcasted by hand along the furrows and mixed with the soil by stirring lightly with a small pick or hand hoe.

Weeding.

A month after planting, the land should be carefully weeded with a *khurpa* or hand-spud. This tool is like a small sickle, both the outer and inner sides are ground or bevelled, so that there are two cutting edges. The weeding should be repeated as often as it is necessary. Usually four weedings are required. The *khurpa* is used not only to remove weeds, but to move the surface soil. This is beneficial as the soil cakes on the surface after irrigation.

Making new beds in June or July.

In June or July new beds are formed. The soil is dug and levelled, and all weeds removed. A second dressing of manure may now be conveniently given. The canes originally planted in the furrows are earthed up with a hand hoe. This leaves a furrow between the rows of cane. These furrows serve as water courses for water, admitted into each water compartment. The earthing up gives support to the cane, so that it does not readily lodge even if a very heavy crop.

Lodging of cane causes loss of sugar. How to prevent lodging.

Lodging is harmful, inasmuch as Dr. Leather has proved by analysis, that lodged cane contains a smaller percentage of crystallizable sugar than upright cane. A sprinkling of *shevri (Sesbania ægyptiaca)* or of castors in the crop and particularly along the water channels and borders gives support to the cane, so that it does not readily lodge. Moreover, the *shevri* and castors yield good returns. Both plants grow to a height of some 15 to 20 feet in a year. The young *shevri* branches are pruned and sold as fodder for milk-goats, and the trees give poles useful for roofing huts. The value of the produce from castors is also considerable. Sometimes, to prevent lodging, cane is tied up. This operation must be carefully done to be effective. Canes from different roots should be tied, about six canes together loosely, but securely, with a band of dead leaves about 4 feet from the ground.

Trashing and wrapping.

Cane is trashed by removing all dead side leaves; thus air gets freer access, and, no doubt, the crop is benefited. Wrapping the cane in its own dry side leaves is a costly operation which, however, probably pays where jackals and rats are very destructive. Jackals will not do much harm to wrapped cane if there is unwrapped cane conveniently near.

Irrigation and amount of water actually given for cane in Poona District.

After July or August in the Poona District cane requires no further attention except watching and careful watering. Irregular irrigation spoils the quality of the crop. It causes in soft juicy varieties splitting of the cane. The land is first flooded as the sets are planted and thereafter two or three times at short intervals to encourage the eyes to shoot. Subsequently, eight to ten days may elapse between waterings; the shorter interval in the hot weather, the longer in the cold season. During breaks in the rains irrigation is required. The rainfall in the Poona District averages about 30 inches. I have found by actual measurement that sugarcane on an average gets during twelve months, in addition to the rainfall, irrigation water equal to 75 to 80 inches of rainfall, the crop being irrigated on an average 28 times in a year. Therefore, the water given at each application was equivalent to 2½ to 3 inches of rainfall or, approximately, 250 to 300 tons per acre. This is the quantity of water taken by an ordinary cultivator when he supplies himself from the canal. He would use less, probably to the advantage of his crop, if he drew the water from a well. We proved by actual experiment that more frequent lighter irrigation was preferable, *i. e.*, that a considerably heavier crop was got by irrigating 34 times during the year, giving in all water equivalent to 50 inches of rainfall in addition to the rainfall (30 inches). The extent of irrigation necessarily depends upon various circumstances. The thin hard bamboo varieties require much less water than the soft thick succulent kinds. In deep moisture holding black or clay soils the interval between waterings in the fair season may be much longer than on soils of lighter description. In the sandy and light loam soils of Northern Gujarát, irrigation for soft cane is necessary every fifth or sixth in the hot weather and every seventh or eighth day in the cold weather. In contrast to this it may be noted that soft varieties, grown in the Surat District on embanked rice fields with deep soil retentive of moisture, if planted deep with a plough in moist soil in November, do not need water until the following February. Cane planted after November requires to be watered in January to assist germination. Six waterings are given between February and the end of May. No artificial irrigation is required in the monsoon, but two or three waterings may be given after the rains in September-October.

Subordinate crops.

Sugarcane makes slow growth during the first three months, and it is quite common to grow with it subordinate crops which ripen quickly. Maize, *guvár (Cyamopsis psoraliodes)*, onions, cucumbers, melons and tobacco are so grown. The maize cobs are plucked before being ripe, and used as a green vegetable. The stalks are cut green, and therefore give much better fodder than that from a dead ripe crop. The *guvár* beans are also plucked green whilst the uprooted stalks are broken up by hand, and with the leaves are left on the ground to serve as a green manure. Onions are grown from transplanted seedlings raised in a separate seed bed. They may reach maturity before the sugarcane quite shades the ground. If they do not, it does not matter as they are quite marketable at almost any stage of growth. Melons and cucumbers are grown from seed planted here and there, but more particularly on the headlands. These plants make very rapid growth in a heavily manured sugarcane field. Tobacco is planted along the water courses and on the *bándhs* of the water compartments, and takes about

five months to come to maturity after the seedlings are transplanted. If the sugarcane, meantime, makes rapid progress, the tobacco will not come to much.

Diseases of Sugarcane.

White ants destructive. Castor-cake as a preventative.

On sandy or light soil white ants are often very destructive. They attack the sets, the roots and the stems. Castor cake used as manure is believed to keep white ants away. In Gujarát a common practice is to put a quantity of pounded castor cake in a reservoir near a well. The irrigation water is made to flow through this reservoir. The cake gets soft and pulpy, and an extract is carried by the irrigation water to the crop. In a few days the manurial value of the cake becomes exhausted, and the spent cake is removed and thrown in the common manure pit. It is quite probable that this is an effective method of using castor cake or perhaps any other cake as manure, and the extract has fully as much effect in keeping white ants away as cake directly applied. It is questionable whether the cake becomes really exhausted by a few days' steeping, yet it may be so, for a somewhat analogous effect is well known by gardeners, *viz.*, that if fresh cow dung or horse dung is steeped in water for several days, a liquid manure is produced which is extremely effective for roses and other plants in pots.

Salt for white ants.

Salt is also used as a preventive for white ants. The method of application is simple. It is tied in a cloth or sack mixed with assafœtida and hung at the head of the water channel, and gradually gets dissolved in flowing water.

Aphides on sugarcane.

Sugarcane is subject to several blights, known by various vernacular names, but all due to aphides which increase rapidly, especially in cloudy weather. Their presence is always accompanied by sticky matter on the leaves. These insects feed on the juices of the plant, and thus exhaust the vigour of the cane. Insecticide spray applications are the only effective remedies. An easily prepared insecticide application would consist of 2 lbs. soap boiled in one gallon of water; and 2 gallons kerosine; churn or agitate the mixture until an emulsion forms; dilute with 15 to 25 gallons of water, and apply to the affected foliage with a spraying machine.

Scale insect.

A species of scale insect is common, and, when it exists to any extent, does considerable harm. An observant cultivator will detect the pest early. All affected leaves should be removed and burnt, and the pest is thus at once checked.

Sugar borer.

The sugar borer, *Diatræa saccharalis* (vern. *Gabra*) often does an immense amount of harm, and yet damage by this insect can be very easily checked, if proper measures are taken in time. The pest usually makes its appearance when the cane has fairly germinated, and the first indication, in the young shoots, is the withering of the uppermost central leaves. The middle or leading shoot can be easily pulled out from its envelope of leaves, and the core of the stalk is found quite rotten with an offensive smell. A number

of small white grubs are always present, and in large numbers if there is much rottenness. These are not the cause of disease, but harmless larvæ of small black or brownish flies which follow the borer. The true cause of the mischief, the larvæ of the sugar borer, is seldom found. The round hole by which it entered may be seen, but when there is much rottenness at the core, the borer has probably gone to another cane. If, when the first sign of withering is seen, the affected cane or shoot is cut close to the ground and slit up, one or more borers will be found in a tunnel made in the solid cane. Professor T. H. Middleton, late of Baroda College, describes the sugar borer thus :—

"The full grown caterpiller is about ⅝" long and ⅛" diameter. The body is yellowish white with purple lines along the back. The head in the young is almost black, is brown in half grown, and light brown in full grown specimens. The sides of the body segments and the tail are furnished with short side-bristles. Young and half grown specimens are very active, but the old caterpillars are slow in their movements. The pupa is about ½" long, is blunted and of brownish colour at the anterior end, pointed and golden yellow at the posterior. The moth emerges from the pupa after seven days. It is grey coloured, ⅜" long with ¾" spread of wings. The first pair of wings is grey with fringed margins and black spots just inside the margin. The second pair is silvery. The abdomen is plump silver grey, and extends ¼" beyond the wings. The moth is very sluggish in captivity, and there is reason to believe that it does not move far from one locality when free."

Remedies for sugar broer.

Cut close to the ground, and burn all affected shoots *as soon as* withering of the central leaves is noticed. The caterpillars are almost certain to be inside the cane at this time. If no remedial treatment is adopted, the insects will run through many generations in a single season, and the crop will be greatly damaged; not only so, but the canes will be so infected that they cannot be safely used for sets for re-planting. The sugar borer also attacks *jowár* and maize, but the moth is so sluggish in its movements that a field cleared of the pest as described above is not likely to be re-infected by insects coming from a distance.

A root parasite.

Sugarcane, like *jowár* and some other cereals, is subject to attack by a vetegable or root parasite, *Striga lutea* (*Tavli*, Deccan; *A'gio*, Gujarát). The *A'gio* of Gujarát appears to have fleshier leaves and stems than the *Tavli* of the Deccan, but they are clearly botanically very much the same, if not identical. The parasite is found thriving close to the stems of cane, or of *jowár*. Its fibrous roots entwine round the roots of the crops named, and check their growth. The parasite grows rapidly, and the only way to save the crop is by constant weeding. *A'gio* belongs to the natural order *Scrophularineæ*. It is found abundantly in grass *kurans* (pasture lands), and therefrom doubtless finds its way to arable land in the dung of animals. It survives without a host; but it can be carried in the host plant. In proof of this, I noticed one particular variety of cane, on the Surat Farm in 1897, badly affected at an early stage of growth. Other varieties in other adjacent beds were not affected. If once established in highly manured sugarcane land, it thrives amazingly. In irrigated land it flowers and seeds at all seasons, and is, therefore, extremely difficult to eradicate.

Smut.

Sugarcane is subject to smut which is probably caused by the same species of *ustilago* as causes the smut, so common in ordinary cereals. Apparently the disease only attacks the flowering rachis, and if it is really confined to these parts, it

cannot do much damage to the crop, as sugarcane does not commonly produce flowers. It is unusual to find varieties, which have long been grown in India producing flowers; but varieties of vigorous habit of growth, which have recently been introduced into India, generally flower freely. I have only observed smut in thin hard or bamboo varieties, and its effect is most curious. At the Poona Farm cane propagated from sets became affected with smut when three months planted. The affected flowering stalks were premature growths. In the ordinary course no inflorescence would have been produced for ten to twelve months after plantation. The presence of disease spores apparently forced the premature growth of the inflorescence in order to provide a suitable host for the disease. The source of infection was obscure; the crop from which the cane sets were got had not been observed to have been affected. Sets from this variety, as well as sets from many other varieties, all grown at Poona were sent to the Surat Farm, and also planted at Poona. At both farms this particular variety and no other variety became affected. It might be urged that the sets, or their eye buds, were obviously the source of contagion. The practice of pickling cane sets in the same way as seed grain, as a preventative is obviously inapplicable; and the only remedy appears to be to remove and burn all affected shoots.

HARVESTING.

Tests of ripeness.

It is difficult to judge accurately by the eye when sugarcane is ripe. Frequently a cane grower tests the ripeness of his crop by a trial boiling. If so many measures of juice give a satisfactory weight of *gul*, harvesting operations are proceeded with, otherwise the work is postponed for a fortnight or longer. A cane crop usually gets a yellow appearance as it ripens, but this colour may also be caused by irregular or deficient irrigation; and a crop that is in want of manure, or is otherwise badly cultivated, gets yellow long before it is ripe. In a well grown crop, if the side leaves are all dead, and if the eye buds almost to the top of the cane are fully developed and firm, the cane is probably quite ripe. I do not think any loss is occasioned if the crop is allowed to stand for a short time after it is dead ripe, provided (*a*) it is not lodged, (*b*) that the eye buds have not begun to freely grow, (*c*) that irrigation is regularly given. If the cane is watered a few days before it is harvested, the amount of sap is increased, so that more juice is expressed by the mill, and, therefore, more sugar obtained.

Reaping.

Method of harvesting.

If it is intended to grow a ratoon crop, the cane should be cut with a sharp sickle at a height of 1 to 2 inches above ground. If no ratoon crop is to be taken, the cane should be uprooted, each cane being separately removed from the root stock by a sharp jerk. Uprooting is easily done as the roots have not a firm hold of the soil. Cane should be reaped, or uprooted, in the early morning whilst the leaves are yet wet with dew. Later in the day, the heads and arms of the workmen would be cut by the sharp edges of the dry leaves. A second man follows each reaper, and with a sickle strips the dry side leaves from each cane. With practice any ordinary cooly can acquire the knack of doing this expeditiously. The upper green leaves, which are useful as fodder, are not removed in the field. The

dry side leaves are left as a litter over the surface of the field. Subsequently, they are collected, and tied into huge head loads, and carried to the *gurhál* to be used as fuel in the *gul* boiling process, or as thatch for huts, etc. The cane is tied into bundles, and carried in head loads to the *gurhál*, or if the distance is far, in carts.

Harvesting and *gul* making done by contract.

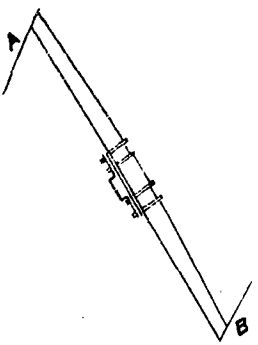
The whole operation of harvesting and *gul* making is undertaken in the Poona District at contract rates. The owner of the field supplies a cane crushing mill or mills, and all *gul* making aparatus, and also lubricating oil. The contracting workmen find four pairs of work cattle for each mill. The cattle are worked in relays, two pairs at a time. Eleven workmen are attached to each mill. Unless each man has an interest in the contract, more are required. They cut and carry cane sufficient to give juice for four boilings in a working day (the work being partly done at night). Each boiling requires 22 *gharas* (earthen pots) of juice. The juice required to fill a *ghara* weighs approximately 42 lbs. One boiling of 22 *gharas* produces one *dhep* or sugar loaf of crude sugar (*gul*), and each *dhep* from the Poona *pundia* variety of cane weighs from 148 to 160 lbs. according to the quality of the juice and the luxuriance of the crop. The contract rate for four *dheps* per day is, generally, Rs. 5. Sometimes it is as low as Rs. 4. The contracting workmen get as muc cane for raw eating as they like. Their women and children surreptitiously take, or at any rate get, a good deal, and every passing wandering beggar expects a good big piece of cane. The contracting workmen get the green tops to feed their cattle. Ordinarily a good many more cattle than the work cattle are actually fed. The extras, *i. e.*, the cane for raw eating, and the green tops for cattle feeding, vary in value in different seasons. Therefore the contract rate also varies.

Crushing.

CRUSHING.

The Poona pattern of cane mill.

The most approved pattern of mill in use in the Bombay Presidency is a three iron roller mill made by several firms in Poona. The mill is made in various sizes. The most common pattern costs Rs. 120, and has three rollers (height of rollers 18″, diameter 11″) ranged vertically between upper and lower cast-iron plates. The two side rollers revolve in sockets, placed on the upper and lower plates. The upper part of each roller is cut like a cog wheel. The cogs of the two side rollers work into those of the middle roller. The draught bar is attached to the central roller, and this roller communicates motion to the two outside rollers. The rollers are adjusted, in respect of closeness to each other, by long iron wedges, which, when driven home at the upper and lower sockets, move the side rollers closer to the central roller. The shaft of the central roller passes through the upper plate. It is round in shape to a height of 6 inches or so above the plate. The rest of its length is square. On the upper square end of the shaft a rest for the draught pole is securely keyed. The draught pole is bolted to this rest.



The draught pole has sometimes at its centre an iron piece fashioned as per marginal drawing. This iron piece is keyed to the squared part of the shaft of the central roller, so that the central roller gets direct motion from the draught pole, as it is turned by a pair of bullocks, attached at A, and another pair attached at B. When the mill is adjusted for work, the rollers should be perfectly vertical and so close together that it is hardly possible to see through between two adjacent rollers.

Cane crushing.

The cane is passed twice through the mill, first between the middle and one outside roller and back between the middle and the other outside roller. These operations go on simultaneously, two men, one on either side of the rollers, being required, one feeding the whole cane, the other feeding the half crushed cane. The draught pole is fixed on the shaft high enough to pass over the heads of these men as they sit in the usual native position at work. Two men or boys drive the work cattle, and it is the duty of one or other of these to remove the crushed refuse as it collects, a basketful at a time, and throw it down evenly in an open space to dry, so that it can subsequently be used as fuel in the boiling process. A man prepares the canes for the mill by removing the green tops and cutting long canes into two shorter lengths for more convenient handling by the man that feeds the mill. Three or four pieces of canes are passed between the rollers simultaneously. Iron mills of the above pattern can, when properly adjusted, express up to 73 per cent. of juice from soft succulent varieties of cane. The quantity of juice expressed in a working day is approximately 3,700 lbs. If the cane is soft and succulent, the working day is short, but long if the cane is hard and less juicy. The edge of the lower plate is turned up about 1½ inch in the shape of a rim. The juice, as it is expressed, collects here, and flows through an opening into a receiver placed under ground. This receiver holds eleven *gharas*, so that it has to be twice emptied to supply juice sufficient for one boiling. The bottom plate of the mill and the top of the underground receiver are practically level with the ground. Close fitting loose boards are placed over the receiver. The man who feeds the half crushed cane sits on these boards and notices that the receiver does not overflow with juice. The juice from the underground receiver is emptied into two iron drums placed near the evaporating pans. It should be strained through cloth or through a wire gauze sieve to remove impurities. When these drums are quite full, the juice is emptied into the evaporating pan. The two drums just hold enough (920 lbs.) juice for one boiling.

Iron mills have taken the place of wooden mills in all parts of the Presidency. In Gujarát and in Dhárwár only a few of the cane cultivators own iron mills. The use of these will extend as the advantages become known. Their advantages, both as regards economy in labour and effectiveness at work, cannot be questioned; still the old wooden mill is very much in evidence. A common belief prevails that the wooden mill gives purer juice which can be made into finer *gul* than the iron mill; but this is mere fancy. The true reason why the wooden mill keeps in favour is that it is made locally, and the parts can be replaced or repaired as they go wrong. The mill costs Rs. 35 to 50. It is slow at work and constantly liable to accident, causing suspension of operations until the village carpenter arrives to repair it. The iron mill is an adaptation of the wooden mill. The latter has three wooden rollers about 3½ feet in length and 1 to 1¼ foot in diameter. These are placed side by side in a strong wooden frame. The upper part of each cylinder is cut out in the form of a screw. The draught bar is attached to the central roller, much in the same way as described for the iron mill. The middle roller is called the husband and the side rollers the wives. The male screw of the central roller fits into the female screws of the side rollers, and communicates motion to the side rollers. The cane has to be repeatedly passed between the rollers before all the juice is expressed. The mill, though clumsy and heavy to work, extracts the juice fairly well. A wooden mill in good working order extracts as much as 56 to 60 per cent. juice from soft succulent cane.

The old fashioned wooden mill.

The evaporating pan in most general use is about 7 feet in diameter and 9 inches to 12 inches deep. It is made of stout sheet iron which in pieces of the required shape are rivetted together. The pan has four circular handles each about 4 inches in diameter, welded or fixed to the lip of the pan at equal distances apart. When it is necessary to place the pan on the furnace or remove it therefrom, two stout poles are passed each through a pair of opposite handles. Four or more men lift the pan and carry it steadily by means of these poles. Two pans are required—one is used for evaporating, the other as a cooler into which the hot *gul* is emptied when boiling is complete.

Gul making.

The oven or furnace is of simple construction. A trench is dug about 18 inches wide, 8 feet long, gradually getting deeper towards one end until a depth of some 5 feet is dug out. A circular excavation is now made at the deep end with a diameter of 4 to 5 feet. This circular chamber and the trench is the source whence the oven or furnace is provided with a draught of air and also provides room for the ashes. The ashes which collect one day are removed before work begins the following day. The furnace which is partly excavated and partly built up is of larger diameter than the ash chamber. It is nearly the same diameter as the evaporating pan, being about 6 inches less, so that the evaporating pan fits neatly on the top of the furnace. The ash chamber being of smaller diameter than the furnace, a ledge is left between the two on which corrugated iron sheets are laid to form the bottom of the furnace. There is a grating in the centre about a foot square. Ashes escape through this, and the draught air is admitted. The furnace is built up with sun-dried bricks in a circular

The boiling process.

orm inside to a height of about 3½ or 4 feet. The brick-work is banked up all round with earth. The front is built up square, and a small opening is left, about 20 inches × 14 inches, through which the fire is fed with fuel as required. The lip of the oven is plastered smooth, so that the evaporating pan fits accurately. The furnace is of large dimensions, because it is necessary to maintain a regular moderate heat during the boiling process.

Preparing the pan.

The pan is prepared before use by rubbing it well inside with leaves of the castor oil plant and then with a paste of *udid (Phaseolus radiatus)* flour and *til (Sesamum indicum)* oil, the object being to prevent the *gul* burning and sticking to the pan. The *udid* flour preserves the oil, so that the pan only requires re-coating occasionally. It is not required oftener than every two or three days.

Professional boilers.

The sugar boilers are professionals in the Poona District, and pretend that special knowledge is required to make good *gul*. There is no mystery in the art further than that a regular heat should be maintained and that all impurities should be skimmed off during boiling.

Fuel.

The dry sides leaves and the dry refuse of crushed cane usually provide sufficient fuel, especially so in the case of a good crop. If extra fuel is required, the husk of safflower or the stalks of *tur (Cajanus indicus)* or of cotton or light brush wood are commonly used.

Feeding the fire.

The fuel should be of such kind that the fire can be continuously fed by small quantities thrown into the furnace at a time.

Skimming.

As soon as the juice begins to boil, impurities rise to the surface in the form of a scum. This should be removed. Skimming is done with a long handled wicker work ladle which allows the pure juice to drain away, but retains the thick scum. This ladle is also used to agitate the syrup vigorously, to prevent boiling over when the fire is too hasty.

Impurities removed.

The impurities are most effectively removed if a mucilagenous extract from the *bhendi (hibiscus esculentus)* plant, is mixed with the juice when boiling begins or at a later stage.

The boiling process.

It usually takes about 2½ hours to boil a panful of juice to the proper consistence. When evaporation is nearly complete, the mass acquires the yellow brown colour of *gul*. It heaves and bubbles rather than boils, and should be kept in constant movement by a wooden hoe moved backwards and forwards in all directions. The syrup is boiled sufficiently when a little put in cold water hardens quickly. The pan is then removed from the furnace. A blessing is invoked, and the contents emptied into the cooling pan. Here the *gul* is stirred repeatedly with a wooden hoe as it cools. When it is cool enough, it is put before it hardens by means of a wooden spatula into a cloth which lines a cylindrical hole in the ground. Here it sets into a hard block or *dhep*. It is removed next day and is ready for sale. If the blocks are pale in colour and hard, the *gul* is considered of good quality.

Comparative trial with different mills.

In 1898 a comparative trial was arranged for in the Dhárwár District by the Agricultural Department to demonstrate the capabilities of the Poona three-roller iron mill, in comparison with the time-honoured wooden mill and with a double squeeze three-roller iron mill made at Bellary (Madras), which has recently come more or less into use in the Dhárwár District. The opportunity was also taken to demonstrate the Poona method of sugar boiling.

I believe that successful demonstrations of this kind are impressed much more forcibly and beneficially on the minds of ordinary agriculturists if conducted by native officers, provided the men so employed have tact, shrewdness, and thorough practical knowledge of the work in hand. The overseer of the stock farm and sugarcane experiments at Mánjri, who is a *Kunbi* or agriculturist by caste, was sent to conduct the trial. With him was also sent a professional sugar boiler of the Poona District, also a man accustomed in the Poona District to feed fuel to the fire during the boiling process. These men could, with their own hands, build a fire place and other necessary construction of a *gurhál* according to the Poona plan. The work referred to and the boiling process require a certain degree of expertness which is very easy to demonstrate by actual practice, but which would be difficult to describe by tongue or pen.

A three-roller mill and all the apparatus necessary for a complete outfit for sugar boiling were sent to Hirekerur, Dhárwár District. The cultivation of sugarcane is very extensive in this place. The apparatus had been in use for two seasons at Mánjri, and the success of the trial may fairly be gauged by the fact that cane cultivators offered to buy the mill and all the apparatus at cost price. In consultation with the Collector, it was decided not to press for freight charges from Poona, because, with the exception of the mill (the freight charges on which would be trifling), the rest of the apparatus can be locally made, now that a proper pattern is available. The freight charges on all the apparatus amounted to Rs. 70, whilst those on the mill only would be under Rs. 20.

The tabulated statements which are given below show that the Poona mill, doing three-fourths of the work in a day, which it ordinarily does in the Poona District, is not only a labour saving machine as compared with the Bellary mill and the old-fashioned wooden mill, but at work is considerably more effective. The amount of juice left unexpressed by the Bellary mill which the Poona mill could have expressed, represents a loss of one pound of *gul* per every 100 lbs. of cane crushed, and in the case of the wooden mill 2½ lbs. of *gul* per 100 lbs. of cane. Forty tons per acre of cane is not a heavy crop, and not more than average for the Poona District, and we may take it that the Bellary mill as worked at Hirekerur left unexpressed juice equivalent to 800 lbs. *gul* per acre of good crop, whilst the wooden mill probably left 2,000 lbs. *gul* per acre of good crop. The cost of the Poona mill could thus easily be recovered in a single season, owing to its more effective work. The question may be raised whether the respective mills were properly adjusted for effective work. The Poona mill certainly was, because the percentage of juice expressed is the percentage ordinarily obtained from good cane. We may assume that the cultivators had the other mills adjusted for

work to the best of their knowledge. The manufacturer of the Bellary mill possibly, if he had been present, could have adjusted it better. The officer in charge was fully instructed regarding the manner in which the trials should be conducted, and had express orders to prevent any attempts to work the cattle in any of the mills beyond their ordinary pace, whilst the trials were in progress, and generally to see that the trials were complete in every respect.

Comparative statement showing the work of the three sugarcane mills tried at Hirekerur, Dhárwár.

Name of the Mill.	Weight of Cane.	Weight of Juice.	Weight of *Gul*.	Percentage of Juice to Cane.	Percentage of *Gul* to Cane.	Value of *Gul* produced in a Day.	Loss of Juice in a Day, taking Poona Mill as the Standard.	Value of *Gul* or Juice thus lost per Day.
	Lbs.	Lbs.	Lbs. oz.	Lbs.	Lbs.	Rs. a. p.	Lbs.	Rs. a. p.
Dhárwár wooden mill with three rollers.	2,343	1,335	299 0	56·97	*12·76	18 0 2	258 (57·7 *Gul*).	3 7 7
Bellary iron mill with three rollers.	2,187	1,395	313 8	63·79	*14·33	18 14 2	92 (20·6 *Gul*).	1 3 10
Poona iron mill with three rollers.	3,882	2,640	528 0	68·00	†13·60	37 2 11	...	...

* Scum not removed during boiling process. † Scum removed during boiling process.

The cost of labour for each mill per day for cutting, carrying and crushing cane and sugar boiling is shown below, also other details (labour being charged at ordinary hiring rates).

Name of the Mill.	Weight of Cane crushed.	Time occupied in crushing.	Weight of Juice obtained.	Weight of *Gul* obtained.	Number of Boilings per Day.	Labour for cutting, carrying, crushing, and boiling, etc.			Remarks.
						Work people.	Bullocks.	Amount.	
	Lbs.	H. M.	Lbs.	Lbs. oz.				Rs. a. p.	
Dhárwár wooden mill with three rollers.	2,343	9 50	1,335	299 0	3	5 men 2 boys	4	2 8 0	Man 4 annas per day. Boy 2 annas per day. Bullock 4 annas per day.
Bellary iron mill with three rollers.	2,187	9 21	1,395	313 8	3	5 men 1 boy	4	2 6 0	
Poona iron mill with three rollers.	3,882	8 33	2,640	528 0	3	9 men 2 boys	8	4‡ 8 0	

‡ The work people had not got experts at the work like Poona cultivators, and the work done in a day with the Poona mill at Hirekerur was about three-fourths of that usually done by contract work near Poona. Four boilings per working day are always done at Poona with manual and bullock labour, equal to that used at Hirekerur, contract wages being, for bullocks and men, Rs. 5 per day.

The first mill is a wooden mill with three vertical rollers fixed side by side in a wooden frame, similar in construction to the mill described on page 109. To work this mill, one man, one lad, one boy, and four bullocks, in relays two at a time, are required; the man to feed the mill, the lad to pass the cane a second time through the mill, and the boy to drive the bullocks.

The following are the measurements of the different parts of the mill :—

Diameter of the middle roller	...	...	1′-6″
Do. of one side roller	...	...	1′-3″
Do. of the other side roller	...	...	1′-1″
Length of each roller	...	...	3′-6″
Length of the beam (draft pole)	...	...	8′-4″

This mill at ordinary speed makes 162 revolutions per hour.

The second mill is a three-roller iron mill. Two of the rollers are of the same size, and the third is smaller in diameter. They are set vertically in a triangle. This mill is very useful for small sugarcane areas. The cane, as it passes through, is double squeezed. One man only, therefore, is required to feed the mill. A boy or lad can drive the two bullocks. Four bullocks are required for a full day's work, in relays, two at a time.

The measurements of the different parts of the mill are as under :—

Diameter of the larger roller	...	0′-8″
Do. smaller roller	...	0′-4½″
Length of the roller	...	0′-10″
Do. beam (draft pole)	...	8′-0″

This mill at ordinary speed made 166 revolutions per hour.

The Poona mill described on page 107 costs Rs. 120, the Bellary mill Rs. 125, and the wooden mill any price between Rs. 35 and Rs. 50, depending upon size, etc.

The pan commonly used in the district has a diameter of 5′-2″ at the top, and is 11″ deep at the centre, and is saucer-shaped.

Gul making.

It is a common practice in the Dhárwár District to mix about 4 ozs. of slaked lime to a pan of 465 lbs. of juice immediately after it is poured in for boiling. People believe that the jagri thus made is harder. The scum, although it rises during boiling, is not skimmed off, and so dark coloured jagri is produced. When the comparative trials were commenced, people visited every day in numbers, and always asked why no lime was used. They noticed the bright colour of the jagri made by the Poona method, and thought it was due to the non-admixture of lime with the juice, whereas it was really due to the removal of the scum by skimming. To prove that the reason assigned by the people was wrong, about 2 ozs. of lime was mixed to a pan, and the jagri was in no way discoloured.* Then

* If the question of discolour was the one at issue, then for fair comparison 8 ozs. for a full boiling of the Poona pan ought to have been used, and that amount would probably have discoloured the jagri. Lime sufficient to nearly neutralize the acidity of the juice only should be added. If used in excess of this, Dr. Leather has proved that it does discolour the jagri. The actual effect of adding lime in proper quantity is to reduce the percentage of molasses in the *gul*, and thus make it harder, so that it will keep better.

the people began to say, "There is much loss in throwing away the scum." An experiment was, therefore, made at a cultivator's *gurhál* with the following results :—

Boiling.	Cane crushed.	Juice obtained.	Jagri obtained.	Percentage of Jagri to Cane.	Value of Jagri per Rupee.	Value of Jagri.
	Lbs.	Lbs.	Lbs. oz.		Lbs.	Rs. a. p.
Scum not removed ...	729	465	104 8	14·4	16·6	6 4 3
Scum removed ...	729	465	97 8	13·3	14·2	6 13 2

The above statement shows a loss of 7 lbs. of jagri when scum was removed. But this was made good by the higher rate obtained when sold. The people were satisfied, but I am not at all sure that quality is always appreciated. In some parts of the Presidency neither the wholesale buyer nor the consumer pays much attention to quality. In parts of Gujarát no skimming is done, and there bright, well prepared Poona jagri is objected to because it lacks flavour.

The only other point on which the people argued was as regards the hardness of the respective blocks of jagri, and which would keep longest during the monsoon. The question was left in abeyance, as it could not be settled off-hand, like other objections.

In Dhárwár jagri is not solidified into blocks as in Poona. As soon as the pan is ready, it is removed from the fire, and stirred for a minute or so, and emptied directly into a *pack* (pit) which is made in the ground, 3 feet long, 2 feet 3 inches wide, and 4 inches deep. The *pack* or pit is sided with planks. The next day the jagri in the *pack* has set hard, and is cut into twelve pieces, each 9" square and weighing from 5 to 7 lbs. While cutting the *pack*, there is generally about 4 or 5 lbs. of broken jagri which the owner keeps for home use. The Dhárwár cultivator shows poor ingenuity in solidifying his *gul*. The Poona method described on page 110 is much better, so also is the Madras plan of using a wooden mould divisioned into cells; but the Gujarát plan of storing in earthenware pots is best of all.

The dry leaves of sugarcane are not used for boiling jagri. They are sold for thatching. Firewood and sugarcane refuse are used for boiling.

In Dhárwár there is not a special man to attend to the boiling as at Poona. The man that feeds the fire also looks after the boiling. The juice for one boiling weighs about 465 lbs., just about half the quantity usually boiled in the Poona boiling pan.

Marketing *gul*.

In the Poone District the *dheps* are sold by the *palla* of 120 *seers* or 240 lbs. By custom 246 lbs. go to the *palla*. Generally throughout Gujarát it is customary to put *gul* into earthenware pots. When sold, a deduction of 5 *seers* per maund or 12½ per cent. is allowed on account of the pots; but usually the actual weight of pots exceeds this allowance. There is a decided advantage in storing *gul* in this manner, because, if soft, there will be no loss of treacle by drainage. Moreover, the *gul* can easily be protected

from flies and other insects. When sold by retail, one side of the pot is broken off, and the *gul* is easily removed in small quantities. In Khándesh the potters who provide the earthern pots claim the crushed cane (*meggass*) as their perquisite. They extract by lixiviation a small amount of inferior *gul*, and use the residue for burning pots and bricks.

Comparative Manuring Experiments at the Ma'njri Experimental Station near Poona.

These experiments were begun in 1894-95, but the plots were not manured in that year in accordance with any definite standard, and were, therefore, unequally manured. Moreover, after a year's experience, it was found expedient to modify the original scheme considerably. The results which I shall record are those of 1895-96 and of 1896-97. The former cop was newly planted cane, the latter was a ratoon crop grown from the root stocks of the previous crop.

Results of two years' experiment recorded.

Objects of the experiments.—To test the comparative values of such manures as are within the reach and means of ordinary cultivators, and when the effects of the various manures have been clearly demonstrated, then to determine whether two or more of the manures used cannot be judiciously combined so as to secure economy.

In both years the various manures each contained 500 lbs. per acre of nitrogen. The percentages of other elements of value are known, and in years to come it may be found that marked differences between the crops of the various plots may be traced to the value of elements other than nitrogen. If this can be done, the value of the experiments will be enhanced, and information be gained which will indicate how two or more manures should be mixed to give the most paying results.

The manures which the cultivators of the Poona District ordinarily use are poudrette, cattle dung, fish manure from the Thána coast, castor cake and *karanj (Pongamia glabra)* cake. In both years we have tested, and will continue to test in comparison with the foregoing, several edible cakes which are now used for feeding cattle in India or are largely exported. These cakes can be bought in Poona at a considerably cheaper rate per ton than the castor and *karanj* cake now so extensively employed as manure. Dr. Leather's analysis shows that the edible cakes contain much higher percentages of nitrogen (the most valuable constituent of manures) than the manure cakes, and our tests indicate that these edible cakes can be employed with economy and success as manure. It has been suggested that the use of edible cake as manure is surely a wasteful practice. My answer to that is that it is surely a much more wasteful practice to feed milch and work cattle with cake and other concentrated food and permit the solid excrement to be burnt as fuel and the urine to be lost. If edible cake is used directly as manure, something is returned to the land which will help to maintain fertility. It might be urged that work and other cattle can only be kept in efficient condition if partially fed on cake or other concentrated food, and, therefore, it becomes necessary to show that the increased production of cane through the use of edible cakes as manure

Several edible oil cakes tested as manures in comparison with those ordinarily used.

more than compensates for the cost of stimulating food given to cattle. This is difficult to show in black and white. At the same time, the fact that an application of 3 tons per acre of edible cake is capable of producing as much as 12,000 lbs. of crude sugar per acre as food for men and 12,000 to 15,000 lbs. of green tops as fodder for cattle proves that edible cake is put to a good use when used as manure. I admit it would be put to a better use if fed to cattle, provided the solid and liquid excrements are properly conserved and used as manure.

No definite relationship between the commercial value of manures and their value according to chemical analyses.

There is no definite relationship between the values of the manures as determined by chemical analyses and their commercial value. It is certain that the cane growers of the Poona District, though much above the average in intelligence, fail to recognise the difference in manurial value of the manures they use.

The results of our comparative manure experiments are not only intended to prove which manures in given quantity are most effective for sugarcane, but also which manures are cheapest. It may be that when a particular manure is shown to be cheap its extended use will soon make it dear, but there will be an advantage to somebody.

Farmyard manure probably the cheapest manure a cultivator can use.

Farmyard manure and cattle dung are charged at full local rates, but it is right to notice that these rates are four times as high as cattle dung sells for in out-districts where irrigated crops are not grown. It will probably be found eventually that, at out-district rates, cattle dung will be proved much the most economical manure that a cultivator can use; because considering its chemical composition, it is much the cheapest. The value for manure will vary with the food given to the cattle and the care with which it is preserved with litter and urine. Properly saved farmyard manure will not, as our experiments indicate, be weight for weight as valuable as pure dung, but then the manure pit will be filled much more quickly with the former than the latter. The dung from poorly nourished animals is considered by ordinary cultivators just as good as that from those highly fed. Both descriptions are with equal readiness used as fuel. In almost all districts the value of cow dung as fuel is as great or greater than its value as manure, because wood is scant and dear. In the Poona District this is notoriously the case. Therefore, it is not surprising that a cultivator of cane sells the dung of his cattle as fuel, and buys poudrette, oil cake, etc., for his crop.

Quick-acting manures give the best results, especially in the case of new cane.

Although the quantity of each manure applied in the "Comparative Manure Series" contained 500 lbs. of nitrogen, there were very great differences in outturn between the various plots. This was particularly noticeable on the new cane, not to such an extent with ratoon. Ratoon cane owing to its greater root development is able to get nutriment from a slow acting manure much more effectively than new cane does in the early stages of growth. At any rate the differences between the plots of new cane were, in a great measure, due to variation in the activity and effectiveness of the various manures. Ratoon cane springs into active and vigorous growth at once, and at the early stage there was no appreciable difference between

its various plots; but in the case of new cane it was clear that some of the manures acted far more actively than others. How far the action was due to the presence in the manures of elements other than nitrogen can only be conjectured at this stage of the experiments. The practical fact remains that certain manures, *i. e.*, fish manure, poudrette and some oil cakes, had quicker action than other oil cakes and much quicker action than cow dung or farmyard manure.

Slow acting manures caused uneven germination.

On plots with slow acting manures, germination was irregular, and the young shoots which did grow were obviously starved and checked in growth. This check was never afterwards recovered.

Oil cake made in country *ghâni* extremely quick-acting.

Oil cakes as made in Europe are generally considered to be slow in their action as manure. Oil cakes as made in the ordinary country *ghâni* are extremely quick in their action. In India oilseed as ordinarily pressed is ground up into an impalpable powder as the oil is expressed. The oil cake is consolidated during the process, but before it is applied as manure it is again powdered, and I have no doubt the minute particles of cake again disintegrate into impalpable powder when brought into contact with the moisture of the soil. It is easy to understand that manure in such a fine state of division will very soon show its effects upon a crop. The method of preparing cake in Europe and in the hydraulic press mills in Bombay is quite different. The seed is crushed, but not into fine particles. The crushed seed is cooked or steamed. Thus the oil freely escapes from the oil cells. The cooking of the crushed seed would of necessity convert the albuminoids into a much more insoluble condition than that in which they exist naturally. The albuminoids contain nearly all the nitrogen of the seed, and it is reasonable to suppose that the nitrogen as it exists in hydraulic pressed oil cake does not become available as plant food nearly so soon as that in oil cake made in the ordinary country *ghâni*.

Hydraulic pressed cake slow in action for reasons given.

The results of the comparative manure experiments which I tabulate below under Series A and Series B will be better understood from the above explanations.

Period of growth.

The new cane was cut in 11½ to 12 months after plantation. Those plots which germinated well and were dressed with quick-acting manures ripened soonest. The ratoon cane was cut 10 to 10½ months after the previous crop was reaped.

Manures applied partly before plantation, partly as a top-dressing.

In 1895-96, the manure was applied three-fifths before plantation in March and two-fifths in July. In 1896-97, the ratoon plots were manured with three-fifths of the application in May and two-fifths in July. It is not customary to give manure to a ratoon crop until it has made considerable growth.

Experiments conducted since 1897 have proved that safflower and niger seed oil cakes are cheap and extremely effective manures for sugarcane, and that applications containing 350 or 400 lbs. of nitrogen are necessary to give the best results in new cane. A dressing of about 250 lbs. nitrogen per acre is sufficient for ratoon cane.

Comparative Manures, Series A, 1895-96 and 1896-97.

	Plot Number.	Manure.	Year of Crop.	Manure per Acre.	Nitrogen per Acre.	Cost of Manure per Acre.	Weight of Cane, stripped and topped, per Acre.	Weight of Tops per Acre.	Weight of *Gul* per Acre.	Percentage of *Gul* to Cane.	Remarks.
				Tons.	Lbs.	Rs. a.	Lbs.	Lbs.	Lbs.		
Manuring Experiments.			1895-96. New cane.	3·3	500	169 6	195,555	12,520	12,320	12·8	Planted 1st April 1895, harvested 23rd to 27th March 1896. Germination very regular. Crop had throughout an extremely healthy appearance, the leaves until the crop ripened being of a rich dark-green colour. Irrigated 27 times.
	2	Safflower cake.	1896-97. Ratoon cane.	3·9	500	185 13	74,768	...	8,430	11·7	Harvested 15th-16th January 1897. Crop looked vigorous and healthy throughout. Irrigated 16 times.
	3	Bassia cake (*mhowra*), *Bassia latifolia*.	1895-96. New cane.	8·6	500	323 9	72,416	12,980	7,725	10·6	The first application of Bassia cake had apparently a poisonous effect. Only a set here and there germinated, re-planted and then germination was quite satisfactory. The top-dressing of manure given in July showed no harmful results. The crop from the second planting made steady, vigorous progress. It was not fully ripe when harvested. If left longer, the results of the next crop would be interfered with. Planted on 1st April 1895, replanted on 8th May 1895, harvested 23rd, 28th March 1896. Irrigated 27 times. The low percentage of *gul* to cane indicates that the crop was not fully ripe.

Plot Number.	Manure.	Year of Crop.	Manure per Acre.	Nitrogen per Acre.	Cost of Manure per Acre.	Weight of Cane stripped and topped per Acre.	Weight of Tops per Acre.	Weight of Gul per Acre.	Percentage of Gul to Cane.	Remarks.
			Tons.	Lbs.	Rs. a.	Lbs.	Lbs.	Lbs.		
3	Bassia cake (*mhowra*), *Bassia latifolia*.	1896-97, Ratoon cane.	8·3	500	299 7	68,820	...	7,895	11·5	Harvested 15th January 1897. Regular germination. Healthy growth throughout. Irrigated 16 times.
6	Cotton-seed cake.	1895-96, New cane.	7·1	500	316 0	83,300	14,925	10,280	12·3	The cake was got from a Bombay mill which, however, has stopped the manufacture, because the percentage of oil got from Indian seed is small and does not pay. The crop had a very thriving appearance throughout. Planted 31st March 1895, harvested 28th to 31st March 1896. Irrigated 27 times.
6	Crushed cotton seed.	1896-97, Ratoon cane.	6·5	500	362 1	73,645	...	9,050	12·3	Crushed cotton seed was substituted for cotton seed cake, the latter not being obtainable. It is believed that in districts where cotton is grown, and where the seed is very cheap, it will probably be found an economical manure for sugarcane grown in the same districts. The dark green colour of the leaves of the cane was conspicuous in comparison with some of the other plots of the series. Reaped 12th-13th January 1897. Irrigated 16 times. The price paid for the cotton seed is much dearer in Poona than in cotton growing districts.

Manuring Experiments.

Plot Number.	Manure.	Year of Crop.	Manure per Acre.	Nitrogen per Acre.	Cost of Manure per Acre.	Weight of Cane stripped and topped per Acre.	Weight of Tops per Acre.	Weight of *Gul* per Acre.	Percentage of *Gul* to Cane.	Remarks
			Tons.	Lbs.	Rs. a.	Lbs.	Lbs.	Lbs.		
Manuring Experiments. 7	Fish manure.	1895-96. New cane.	2·9	500	188 12	90,485	14,445	11,990	13·2	The evenne ac of germination ne and vigour of wth were near l as conspicuous s in Plot 2. Th manure muke be ploughed ext or dug in d ly; otherwise ws, jackals, do oil and pigs are att ted. Crop plant or 31st March 1895, th ped 10th to r 7th March 1896, u rrigated 26 nes. The high p ent-age of *gul* tuli ane is noticeabl act
		1896-97. Ratoon cane.	2·7	500	164 7	76,845	...	9,050	11·7	Reaped 12th and 13th January 897. Irrigated 17 ones.
8	Castor-cake.	1895-96. New cane.	5·9	500	303 10	80,770	13,010	9,820	12·1	Germination g and tillering nite satisfactory ly but the crop is had not the th ing, vigorous a ear-ance and h in thy colour of th best plots in the ie ies. Planted un 1st March 189 ar-vested 11 ex to 17th March 896. Irrigated 26 ie nes.
		1896-97. Ratoon cane.	6·2	500	292 11	79,400	...	9,780	12·3	This plot ga the best crop d the whole ies. Harvested ca 1th and 12th J ary 1897. Irri ted 17 times.
9	Karanj cake (*Pongamia glabra*).	1895-96. New cane.	6·6	500	280 0	83,270	10,915	9,770	11·7	Very little diffes nce in the appe ance of this an ssi the adjoining tor cake plot. nt-ed 31st na rch 1895, har ted 12th and pe 7th March 1896. se rrigated 26 tim an
		1896-97. Ratoon cane.	5·3	500	203 7	70,600	...	8,445	12·0	Reaped 10th and 11th January 97. Irrigated 16 hes

Plot Number.	Manure.	Year of Crop.	Manure per Acre.	Nitrogen per Acre.	Cost of Manure per Acre.	Weight of Cane stripped and topped per Acre.	Weight of Tops per Acre.	Weight of *Gul* per Acre.	*Percentage of Gul* to Cane.	Remarks.	
			Tons.	lbs.	Rs. a.	Lbs.	Lbs.	Lbs.			
12	Poudrette	1895-96, New cane.	22·3	500	150 8	80,720	11,455	10,455	12·9	Results conspicuously good as compared with some other manures. Our results and chemical analysis indicate that the manure is a cheap, if not the cheapest, source of nitrogen in India even at the Poona price which is very high. This manure is only obtainable at populous centres; costly to transport. Crop planted 30th March 1895, harvested 13th to 19th March 1896. Irrigated 26 times.	Manuring Experiments.
		1896-97. Ratoon cane.	20·1	500	179 13	55,405	...	7,410	13·4	The crop was somewhat disappointing. Germination was satisfactory, but the crop at no stage of growth had the thriving appearance of the previous year's crop. Harvested 8th and 9th January 1897. Irrigated 16 times.	
13	Cattle dung from ordinary fed cattle.	1895-96, New cane.	25·1	500	160 0	60,490	12,220	7,510	12·4	The results compared with some other plots are poor. Heavy dressing of the same manure was given in the previous year to the plot also with poor results. The inference is that cattle dung is slow in its action. The germination was quite regular, but the crop had throughout a yellow, unhealthy appearance. Planted 30th March 1895, harvested 20th and 21st March 1896. Irrigated 27 times.	

	Plot Number.	Manure.	Year of Crop.	Manure per Acre.	Nitrogen per Acre.	Cost of Manure per Acre.	Weight of Cane stripped and topped per Acre.	Weight of Tops per Acre.	Weight of *Gul* per Acre.	Percentage of *Gul* to Cane.	Remarks.
				Tons.	Lbs.	Rs. a.	Lbs.	Lbs.	Lbs.		
Manuring Experiments.	13	Cattle dung from ordinary fed cattle.	1896-97. Ratoon cane.	18·9	500	127 12	70,445	...	8,150	11·6	This plot gave much more satisfactory results under ratoon cane than in the previous year. Owing to the well-known lasting effect of cattle dung, the crop probably benefited by the unexhausted residues of the same manure applied during the two previous years. Harvested 7th and 8th January 1897. Irrigated 15 times.
			1895-96. New cane.	29·0	500	184 14	53,790	11,175	6,950	12·9	The remarks made against Plot 13 apply equally to this plot. Crop planted 30th March 1895; harvested 20th to 24th March 1896. Irrigated 27 times.
	14	Cake-fed cattle manure mixed with urine and litter.	1896-97. Ratoon cane.	25·09	500	142 12	62,205	...	7,870	12·6	Ratoon crop more satisfactory than the previous year's crop of new cane. It is, however, clear that there are more satisfactory manures for sugar-cane than either farmyard manure or cattle dung. Crop harvested 7th January 1897. Irrigated 16 times.

Plot Number.	Manure.	Year of Crop.	Manure per Acre.	Nitrogen per Acre.	Cost of Manure per Acre.	Weight of Cane stripped and topped per Acre.	Weight of Tops per Acre.	Weight of *Gul* per Acre.	Percentage of *Gul* to Cane.	Remarks.
			Tons.	Lbs.	Rs. a.	Lbs.	Lbs.	Lbs.		
15	Safflower and ground-nut cake.	1895-96. New cane.	3·4	500	162 0	63,600	10,960	7,900	12·4	The cake used is a hydraulic pressed cake made in Bombay from coarsely ground steamed seed. For this reason the cake possibly acts slowly. The results are poor for a cake so rich in nitrogen and compare unfavourably with the other oil cakes, which, however, were all made in the country *ghâni*, and, therefore, probably acted more quickly. Planted 30th March 1895; harvested 1st to 23rd March 1896. Irrigated 27 times.
		1896-97. Ratoon cane.	3·6	500	158 15	68,030	...	7,680	11·3	The crop looked fairly promising during the whole period of growth, but the outturn of *gul* is rather disappointing. It may clearly be inferred that hydraulic pressed cake made from coarsely ground steamed seed is slow in action, even though rich in nitrogen. Harvested 18th and 19th January 1897. Irrigated 16 times.

Comparative Manures, Series B, 1895-96 and 1896-97.

	Plot Number.	Manure.	Year of Crop.	Manure per Acre.	Nitrogen per Acre.	Cost of Manure per Acre.	Weight of Cane stripped and topped per Acre.	Weight of Tops per Acre.	Weight of *Gul* per Acre.	Percentage of *Gul* to Cane.	Remarks.
				Lbs.	Lbs.	Rs. a.	Lbs.	Lbs.	Lbs.		
Manuring Experiments.	4	Bone-meal.	1895-96. New cane.	3,520	130	116 0	32,145	8,875	3,905	12·1	A heavy application of bones (5 tons per acre) was given to this plot in the previous year with poor results. It might reasonably have been expected that the residue left would have benefited the crop of this year. There is nothing to indicate that such is the case. The action of bones is so slow that they cannot be economically used as manure for sugar-cane. The crop had the appearance of being starved throughout its growth. Planted 1st April 1895; reaped 25th to 27th March 1896. Irrigated 27 times.
			1896-97. Ratoon cane.	3,343	130	122 14	30,900	...	3,705	11·9	The results this year with ratoon confirm the above remarks. Reaped 14th January 1897 Irrigated 16 times.

Plot Number.	Manure.	Year of Crop.	Manure per Acre.	Nitrogen per Acre.	Cost of Manure per Acre.	Weight of Cane stripped and topped per Acre.	Weight of "Tops per Acre.	Weight of *Gul* per Acre.	Percentage of *Gul* to Cane.	Remarks.
			Lbs.	Lbs.	Rs. a.	Lbs.	Lbs.	Lbs.		
5	Dissolved bones.	1895-96. New cane.	3,520 bones dissolved in acid.	130	196 0	36,275	8,535	4,950	13·6	Manured with 6 tons per acre dissolved bones in previous year. Crop fair, but cost of such a heavy dressing of manure entirely prohibitive. This year manure made on farm. Acid of ordinary commercial strength used; 640 lbs. acid to 3,520 lbs. bone-meal. The price of the manure is entirely prohibitive for ordinary cultivation in the Poona District. Planted 1st April 1895, harvested 27th and 28th March 1896. Irrigated 27 times.
		1896-97. Ratoon cane.	4,404 dissolved bones or 3,343 crushed bones dissolved in acid.	130	207 5	54,845	...	6,365	11·6	Better results, but not good enough to pay, considering the expensive dressing of manure. Reaped 13th and 14th January 1897. Irrigated 16 times.

Manuring Experiments.

	Plot Number.	Manure.	Year of Crop.	Manure per Acre.	Nitrogen per Acre.	Cost of Manure per Acre.	Weight of Cane stripped and topped per Acre.	Weight of Tops per Acre.	Weight of *Gul* per Acre.	Percentage of *Gul* to Cane.	Remarks.
				Lbs.	Lbs.	Rs. a.	Lbs.	Lbs.	Lbs.		
Manuring Experiments.	10	Bone-meal and crude nitre.	1895-96. New cane.	3,520 bone-meal, 1,290 nitre.	250	264 0	41,000	10,075	5,015	12·2	One-fifth of the nitre was applied before plantation; the rest in four equal top dressings given in June, August, October and December. It was believed to be economical to apply the nitre in top dressings, because, being very soluble, it is easily washed away in drainage if not taken up by the crop almost at once. The crop did not benefit to the extent that was expected, and the cost of the manure exceeded the value of the crop. Planted 30th March 1895; harvested 30th and 31st March 1896. Irrigated 27 times.
			1896-97. Ratoon cane.	3,343 bone-meal, 1,230 nitre.	250	255 0	50,385	...	4,900	9·7	Nitre applied in 5 top dressings at intervals as above. The cane only yielded 53·7 per cent. juice, whereas the average of all other manure plots was approximately 68 per cent. The percentage of *gul* to cane is very low. I can offer no satisfactory explanation. Again the cost of the manure about equals the value of the crop. Reaped 9th and 10th January 1897. Irrigated 15 times.

Plot Number.	Manure.	Year of Crop.	Manure per Acre.	Nitrogen per Acre.	Cost of Manure per Acre.	Weight of Cane stripped and topped per Acre.	Weight of Tops per Acre.	Weight of Gul per Acre.	Percentage of Gul to Cane.	Remarks.	
			Lbs.	Lbs.	Rs. a.	Lbs.	Lbs.	Lbs.			
11	Dissolved bones and crude nitre.	1895-96. New cane.	3 520 bone-meal dissolved and 1,290 nitre.	250	344 0	65,715	11,695	8,435	12·8	Nitre applied as in Plot 10 for similar reasons. It is clear that dissolving the bones makes the manure more effective, but the cost is entirely prohibitive. Crop planted 31st March 1895; reaped 29th to 31st March 1896. Irrigated 27 times.	Manurial Experiments.
		1896-97. Ratoon cane.	3,343 bone-meal dissolved or 4,404 dissolved bones and 1,230 nitre.	250	344 6	62,905	...	7,845	12·5	Nitre applied as above. Crop reaped 8th and 9th January 1897. Irrigated 15 times.	

Cost of cultivation.

The estimated cost per acre of cultivating sugarcane by hired labour in the Poona District is as follows :—

	Rs.	a.
First ploughing in November ; 4-team plough does an acre in 4 days ; 1 ploughman and 2 boys or lads driving	10	0
Second and third ploughing in December	12	0
Levelling with log harrow twice and breaking clods by hand implement ...	3	0
Manure ; cartage and spreading 25 tons poudrette per acre	180	0
Ridging ; ridges 24" apart ; 3-team plough, 1 ploughman, 1 driver ; 1 acre per day	2	8
Making water compartments : contract rate	2	4
Value of sets, 18,000 per acre	50	0
Carrying sets to field ; first watering and planting	5	0
Watering 32 times in a year ; 1 man for 5 acres at Rs. 7½ per month	18	0
Hand weeding ; first weeding a month after planting and other three at intervals as required until June	12	0
Digging and making new beds in July	10	0
Water rate (canal water)	40	0
Cost of constructing *gurhál* ; Rs. 10 or Rs. 2 per acre	2	0
Hire of sugarcane mill and other apparatus ; Re. 1 per day or Rs. 16 per acre.	16	0
Harvesting and *gul* making at contract rate of Rs. 5 per 600 lbs., say ...	85	0
Marketing *gul* and commission to *Dalál* as at Poona. Crop, 40 *pallas* of 246 lbs. per acre	39	0
	486	12
Value of crop ; 40 *pallas* at Rs. 14 per *palla* (price varies in any season from Rs. 12 to 18)	560	0

In growing a ratoon crop the cost of preparatory tillage is trifling. No sets are required ; less manure is required than for new cane. The crop requires less irrigation than new cane, and altogether the saving in the cost of cultivation as compared with new cane is Rs. 120 to Rs. 150 per acre. A ratoon crop which has thriven well yields as much *gul* per acre as a fairly good crop of new cane. On page 99 I have shown the actual cost of cultivation in an experimental plot at Mánjri at Rs. 325 per acre and value of produce at Rs. 447.

Dr. Leather's investigations into the chemistry of the sugarcane crop have been published in full detail in the *Agricultural Ledger (Medical and Chemical Series Nos. 1, 4 and 9).* The following is a succinct résumé of the work as published in paragraphs 114 to 128 of Dr. Leather's Final Report :—

Conf. Agricultural Ledgers, Nos. 18 of 1895, 19 of 1896, and 3 of 1897.

"114. The investigations may now be conveniently referred to under the following heads :—

(1) The composition of the juice—(*a*) in cane which had been transferred to long distances ; (*b*) in cane which had been grown with varying amounts of manure ; (*c*) in cane which had become *lodged* ; (*d*) in the top ends of the cane ; (*e*) in different varieties of cane.

(2) The relation between the amount of sugar in juice and its specific gravity.

(3) The determination of the amount of inversion which takes place during the concentration of the juice.

(4) The amount of sugar which becomes lost in the scum.

(5) The composition of the raw sugar, *gur*, *gul*, and *rás*.

(6) The refining of sugar by meanes of the hand centrifugal separator.

(7) The total amount of sugar in cane and the amount remaining in the crushed cane.

(8) The amount of phosphoric acid and nitrogen in the sugarcane crop.

Chemistry of sugarcane.

"115. (1—*a*)—*The composition of the juice of cane which had been transferred to long distances.*—In the course of the experiments under reference, several varieties of cane have been transported to considerable distances. In 1894 two varieties were sent from the Mauritius to Poona—one a white and the other a red variety. They were grown at Poona with very liberal amounts of manure, and, so far as appearances went, both crops were splendid. They were reputed to give a juice containing some 18 per cent. of sugar. But at Poona the juice of both has contained much less than this amount. In 1895 the juice of the white variety contained about 12 per cent. of cane sugar and 1·4 of glucose; that of the red variety about 10 per cent. cane sugar and 2 of glucose. In 1897 (the third crop) the corresponding figures were 14·71 per cent. cane sugar and 0·99 of glucose in the juice of the white, and 12·7 of cane sugar and 1·5 of glucose in that of the red variety. Thus, although the juice is still poorer than it ought to be, a material improvement has manifested itself during the three years.

"A second example of this nature occurred in the case of the Poona *pundia*, the variety commonly grown around Poona. This cane at Poona has been found to contain from 16 to 18 per cent. of total sugar. It was sent to Cawnpore and Dumraon in 1895, but the crops at both farms produced a juice containing only 14 per cent. of total sugar in the 1895-96 crop, and there was just about the same amount in the crop of 1896-97.

"Some further evidence was gained during the past season. A number of varieties, commonly grown in the Bombay Presidency, were collected in 1895 and grown at Poona in 1896. These crops were then analysed in the succeeding cold weather. Immediately afterwards I visited villages in the neighbourhood of Belgaum and Dhárwár, and analysed some of these same varieties in their native place, and it was then found that in three cases the quantity of the juice was much lower, in two instances it was higher, and in one it was the same at Poona as in the crops at Belgaum and Dhárwár. Thus the evidence at hand points to the conclusion that transference of cane from one country to another may cause a material alteration in the development of the plant generally resulting in depreciation of the juice. The evidence given by the Mauritius varieties, however, indicates that the cane will gradually assume a normal composition in the course of a few years. *

"116. (1-*b*).—*The composition of the juice of cane which has been grown with varying amounts of manure.*—One of the questions which naturally presented itself at the commencement of the experiments was, 'What effect has manuring on the quality of juice of sugarcane?' The plots at Poona and at Cawnpore received in each case very varying amounts of manure, and the question appeared to be one which would be readily solved. Accordingly, one or more samples of the juice of the cane from each of the plots in question at these two farms were analysed during the harvest. The results at first obtained are quite uniform.

"The cane at Poona (*pundia*) was grown with a series of different manures, varying very much in amount, the nitrogen from 130 to 1,000 lbs. per acre, and the phosphoric acid from 140 to 2,700 lbs. per acre; in all cases the amount of manure was large. The percentage of both cane sugar and glucose was found to be very constant in each year, namely, from 15 to 17 per cent. of cane sugar and 1·0 to 1·8 per cent. of glucose.

"At Cawnpore a small cane, the *matna*, was grown in 1894-95 and 1895-96, with different descriptions of manure, in varying amount (the nitrogen varied from *nothing* on the unmanured plot to nearly 200 lbs. on the most heavily manured plot), the weight of manure being in all cases very much smaller than was the case at Poona. Again, the analyses of the juice of this cane showed no relation between the amount of manure applied and the quality of the juice; the cane sugar varied from 14 to 17 per cent. the first year and from 15 to 17 per cent. the second year, and the glucose from ·3 to ·5 per cent. Thirdly, at Cawnpore in 1896-97 another variety was grown, a thick *pundia* called *madrási*, and this was manured with different materials containing from 200 to 500 lbs. nitrogen per acre, the amounts being in every case *large*. The percentage of cane sugar varied from 14 to 15·5 per cent. and the glucose from 0·5 to 0·9 per cent.

"Thus the evidence adduced from three somewhat extensive series of tests pointed uniformly to the conclusion that neither the kind of manure, nor its amount, exercised any influence on the quality of the juice of sugarcane.

"It so happened, however, that conflicting evidence was met with during the cold weather of 1896-97 at Cawnpore. *Six* varieties—three thin ones and three thick ones—have been grown at this farm for three years. One of these was the *matna* variety already alluded to. In 1896, it was decided to grow this variety (along with the others) with large amounts of manure. It now grew much taller than usual, and the weight of crop was much increased. When, however, the juice came to be analysed, it was found that instead of containing the 15 to 17 per cent. of cane

* This is confirmed by the remarkable manner in which the Southern Maratha varieties recovered to their normal standard in the second year of cultivation at the Poona Farm although they had deteriorated considerably in the first year's cultivation. (See description of Bombay varieties, pages 142 to 153.)—J. M.

sugar which had been maintained for two years, the proportion had fallen to 11 per cent.; on the other hand, the proportion of juice expressible by the mill, which had previously been 45 to 50 per cent., was now found to be 60 per cent.

"Another piece of similar evidence was obtained in connection with the Dumraon experiments, where it is probable that high manuring had, in the case of certain canes, reduced the proportion of sugar. But a consideration of the evidence on this subject clearly offers an explanation of the effects noticed.

"It is certain that under the conditions of growth of the Poona *pundia*, the *matna*, in 1894-95 and 1895-96, and the *madrási* in 1896-97, manuring had *no* material effect; and those conditions are readily set out. The Poona cane is commonly grown with large amounts of manure, and it was similarly supplied in the experiments. The *matna* is commonly grown with only small amounts of manure and only small amounts were supplied to it at Cawnpore in the first two years. Thirdly, the *madrási* variety is commonly heavily manured and the treatment for it was similar in this respect at Cawnpore in 1896-97. Thus, *while the conditions of manuring assimilated to those to which the several varieties are accustomed*, the proportion of sugar remained normal, whereas, if the one or two cases of sudden change in the composition of the juice due to heavy manuring are to be relied on, it would appear that a variety *may* produce a poor juice if it be suddenly grown with much larger amounts of manure than those to which it has been accustomed for long periods.

"It must not be supposed, however, that a less outturn of sugar was realised in the case of *matna*. Although the percentage of sugar in the juice was less, much more juice was obtained, and the crop was about twice as heavy. So that, from the economic point of view, there was a considerable gain. Moreover, the evidence, such as it is, of the varieties at Dumraon, point to the fact that under the new conditions the varieties will *regain* their normal growth in the course of a few years. The case is indeed very similar to that referred to in paragraph 115, where the effect of change of climate is discussed, and it seems likely that a cane may suffer from either cause; the effects are, however, probably only temporary.

"117. (1-*c*).—*The composition of the juice of cane which had become lodged.*—The crop of cane at Cawnpore was much lodged in 1894 by rain, and it was decided to crush the fallen cane separately from that which remained erect. It was then found that the juice of the lodged cane contained *much* less sugar than that in the standing cane, and the *gur* prepared from it was so full of molasses that it would not solidify. In the other two years the weather was not abnormally wet, and no further evidence of the effects of heavy rain has been obtained; but the crops at Cawnpore and Dumraon were so heavy in 1896 that some parts fell down. The juice of the fallen cane was again separately examined, with the result that it was found to contain generally a less proportion of cane sugar, and a larger one of glucose, than was found in the standing cane. The differences were on the whole not great, and nothing like so serious as was the case with the crop which had been *lodged by rain* in 1894.

"118. (1-*d*).—*The composition of the juice of the top ends of the cane.*—My attention was directed to the quality of the juice in the top ends of the cane, because in the Burdwan District of Bengal it is customary to propagate the crop from the top ends only, whilst in most parts of India the usual practice consists in cutting up whole cane into pieces and propagating from them.

"Moreover, it so happens that in no part of India is the cultivation of cane, in most respects, more perfectly carried out than at Burdwan, and one at least of the varieties there grown is an exceptionally good one, containing from 16 to 18 per cent. of sugar. In no respect, therefore, could it be said that the quality of the cane or the cultivation was inferior. Now the weight of cane which is used for sowing is very considerable, amounting to several thousand pounds per acre, and the question naturally presented itself, what sort of juice is contained in the top end of the cane, and is it an economy in the matter of sugar to propagate from the top ends only? Accordingly, several sample bundles of cane were taken at Burdwan this year, the top ends cut off, and the juice expressed and analysed from the top ends and the remaining cane respectively. The experiment showed quite conclusively that there was much less juice in the top ends than in the main part of the stem and much less sugar in that juice. Consequently, it is apparent that, if an acre be sown with the top ends of the cane, and the main part of the cane be reserved for sugar-making, an economy in sugar will result. Taking the figures which were obtained in the experiment as a basis of calculation, this economy amounted to about 320 lbs. of raw sugar in the case of one variety, and to about half that amount in the case of another; or we may say that by propagating from the tops only, a saving of several hundred pounds of raw sugar per acre will be realised.

"It appeared desirable that other varieties should be propagated from the top ends only, in order to determine whether any deterioration of quality resulted, and this is being done at Cawnpore with cane which has always been grown from the cut-up whole cane; but unless such deterioration should manifest itself, it must mean a great saving to cultivators to plant from the top ends only.

" 119. (1-e).—*The composition of the juice of different varieties of cane.*—The amount of juice expressible by the mill, and the proportion of the cane sugar and glucose in the juice, has been determined for a number of varieties, some of which have been grown at the farms, some in villages at a distance from them. The amount and quality of the juice has varied a good deal between the worst and the best.

" The proportion of juice expressible will be dealt with under (7).

" The juice of the better varieties, such as the Poona *pundia*, the *samsára* of Bengal, and the *madrási pounda*, all contain high proportions of sugar varying from 14 to 18 per cent. of total sugar, and I am certain that no better cane can be obtained anywhere than these. Some of the thin varieties, too, such as the *matna* of the North-Western Provinces, *mungo* of Behar and *khári* of Bengal, give a juice containing similarly high proportions of sugar. On the other hand, some such as the *dikchan* and *dhaul* of the North-Western Provinces have much less sugar in their juice. Of the total sugar, the greater part is of course cane sugar.

" The glucose has in most cases been determined in the juice also, and its proportion varies from a half up to two per cent.

" The *acidity* in the juice was determined in a number of samples in 1896, but the results obtained I consider uncertain. The colour of the juice is so dark that a difficulty was experienced in using 'indicators.' The question of the amount and the kind of acidity is nevertheless an important one, for, as will become evident when explaining the experiments which I made to prevent inversion when boiling the juice, this constituent causes a serious loss of crystallizable sugar. What is required is a method, both simple and rapid, for determining the amount of organic acids, other than carbonic acid, which may be used in the field, and I had not time to work one out.

" 120. (2).—*The relation between the amount of sugar in sugarcane juice and its specific gravity.*—Owing to the increasingly large number of analyses of juice which it was desirable to make in connection with these sugarcane experiments, and also to the fact that a chemist is only occasionally at the farms at the time of harvest, the need became apparent of some simple method of determining approximately the amount of sugar in juice.

" In the case of sugar being dissolved in pure water, its amount may be determined with very fair accuracy by observing the specific gravity of the solution, there being a very simple relation between the two.

" Sugarcane juice is not, however, a solution of only sugar in water; other substances are present besides, which affect the density. It occurred to me, however, that the amount of these other substances might be fairly constant, and, if so, the insertion of a uniform correction would enable one to calculate the percentage of total sugar from the specific gravity.

" Accordingly, I compared the specific gravity of a large number of samples of juice with the amount of sugar actually found by analyses. The result of this was that the difference between the percentage of sugar as shown by the hydrometer and that actually present proved to be fairly constant as I had expected. This difference amounted to about 2 per cent. in the majority of cases, and I calculated out a set of tables by means of which any one can find out the per cent. of total sugar with the aid of a hydrometer. Of course, such a method is only approximate, but the result will not be more than half a per cent. from the truth. Also it is to be observed, one only learns the amount of *total* sugar by this means, but since the amount of glucose is only small, the method will be found very useful for field work, when the more exact methods of the chemist are not available.

" 121. (3).—*The amount of inversion which takes place when boiling down the juice.*—All cane juice contains organic acids, and these at a boiling heat possess the unfortunate property of converting a part of the crystallizable cane sugar into uncrystallizable glucose. So far as the *food value* of the resulting sugar is concerned, the change is probably of no great consequence.

" But in other respects the change is very serious. Not only are molasses useless and inconvenient to the refiner, to the small native refiner, just as much as to the large operator with European appliances, but to the *Bunya* who has to store the *gur* or *gul* through the rains, the matter is of equal importance, because the larger the proportion of molasses, the more liable is the *gur* to liquefy in his *godown*. I found that whereas in *the juice* each 100 parts of total sugar includes usually from 2 to 10 parts of glucose, in the *gur*, as ordinarily made, the proportion of glucose ranged from 10 to 20 parts. In addition, it is to be borne in mind that each part of glucose will prevent an equal weight of cane sugar from crystallizing, so that these figures have to be doubled in order to express the true effect of this glucose formation. In endeavouring to find a means of preventing the change, it was necessary to employ only such a method as the ordinary cultivator could use, and I believe I have more or less succeeded. The addition of a small quantity of quicklime in water will neutralise the acidity of the juice, and thus prevent in a great measure the process of inversion. Too much lime must not, however, be employed, other-

wise the resulting sugar becomes black, and its market value decreased. Litmus paper was at first employed to detect when sufficient lime had been added; later I found that there is a natural colouring matter in the juice which could be equally well employed.

"The result of the careful addition of lime is to prevent very materially the formation of molasses, and the *gur* obtained has a much better crystal. That which has been made at Cawnpore has realized distinctly a higher price in the bazar than that produced by simply boiling down the juice. Likewise in some experiments which I made in villages on Messrs. Thomson and Mylne's estate this year, the results were equally satisfactory.

"122 (4).—*The amount of sugar which becomes lost in the scum.*—When boiling down the juice, scum rises to the surface, and is skimmed off more or less perfectly with ladles. The amount of this scum is considerable, and it seemed desirable to make one or two determinations of the amount of sugar which must of course be carried along with it.

"Accordingly, in the cold weather of 1895-96, I estimated very accurately the amount of sugar actually present in the juice, and later, after the *gur* had been made, the amount of sugar in it. The difference between these two amounts is due to the sugar which had been carried away in the scum. Four experiments were made at Cawnpore and four at Poona. The loss of sugar proved to be from 10 to 14 parts per hundred in the juice.

"This sugar which is unavoidably taken in the scum is, however, not wasted. At Poona the people recover part of it by putting the scum into water, boiling the liquid and again skimming off the scum. At Cawnpore the scum is given to cattle as a food.

"123. (5).—*The composition of the raw sugar.*—By far the greater part of the cane juice produced in India is simply evaporated down (after removing the scum) to such an extent that on cooling the mass becomes solid. This description of raw sugar is called *gur* in the North-Western Provinces and Bengal; in the Deccan it is called *gul*. Whilst still hot, the raw sugar is usually run into moulds where it solidifies in blocks weighing from 25 to 100 lbs. Sometimes, as in parts of Oudh, the *gur* is made up whilst warm and soft into rounded pieces about a couple of inches in diameter, and again in other districts, *e.g.*, Dehra Dun, it is run out on bamboo matting whilst hot and allowed to solidify in thin cakes. These are, however, minor practices, and are not deserving of recommendation. Some of the Oudh *gur* proved to be exceedingly dirty.

"The composition and colour of this description of raw sugar will vary very considerably, much depending on both the quality of the juice and the mode of working.

"If the cane becomes *laid* by rain, the juice will contain a high proportion of glucose (*vide* paragraph 117), and the resulting *gur* will be soft. Again, if the juice be poured through a cloth or brass wire strainer, much dirt and bits of cane are separated; it is indeed surprising how much dirt can be removed from the juice by this means. During the boiling process the more perfectly the skimming is effected, the purer will be the product and the better its colour.

"Finally, if the acidity of the juice be neutralised, the *gur* will contain a lower proportion of molasses (*vide* paragraph 121).

"Some samples of cultivators' *gur* from Oudh, which I analysed, contained of cane sugar from 63 to 72 per cent., glucose from 9 to 10 per cent., mineral matter from 3 to 4 per cent., water and other impurities from 15 to 24 per cent.

"The samples of *gur* made from *laid* cane at Cawnpore in 1895 contained from 64 to 68 per cent. cane sugar and 13 to 14 per cent. glucose, whereas the *gur* from the erect cane of the same crop contained from 70 to 75 per cent. cane sugar and 8 to 10 per cent. glucose. But with good cane and careful manufacture, the *gur* will contain from 70 to 78 per cent. cane sugar and from 5 to 15 per cent. of glucose.

"124. In addition to the solid *gur* or *gul*, another description of raw sugar is prepared by removing the mass from the fire at a somewhat earlier stage and before all the water has been boiled out. The resulting sugar never solidifies entirely, but a great deal of the cane sugar crystallises out during the first few days, and the mass becomes semi-solid. It goes by the name of *râb* in many parts, but in parts of Bengal it is also called *gur*.

"The composition of *râb* will vary somewhat according to the amount of water which is left in it. That made at Burdwan this year contained from 65 to 73 per cent. cane sugar and 5 to 10 per cent. glucose, but one of the samples was undoubtedly below average for some reason or other. Other samples from Behea, which were prepared in my presence, contained from 69 to 75 per cent. cane sugar and only 2¾ to 5 per cent. glucose, and there is no doubt that, given good cane and careful manufacture, the latter standard can be maintained.

"This description of sugar is prepared specially for the purpose of refining. Frequently it is put into sacks which are then placed one on another in order to increase the pressure on the lower ones, and the molasses gradually run out more or less. Or again the refining process is

effected by placing the *râb* in a vessel having a 'false bottom.' A wet weed (*sewar*) is then placed on the surface, and the molasses gradually leave the top layer of sugar. This purified layer is then scraped off, and the *sewar* applied to the next layer, and so on until the whole has been refined. In neither of these refining processes are the molasses obtained in a fit state for human consumption, and this means a loss of fully one-third of the sugar operated upon.

"One sample of sugar refined by this process contained 96·6 per cent. of cane sugar and 0·89 per cent. glucose.

"125. (6).—*The hand centrifugal sugar separator.*—Another much better means of separating the molasses from the sugar crystal of *râb* has been provided by Messrs. Burrows, Thomson and Mylne of Behar, who have introduced a centrifugal machine, worked by one man at a time, by means of which the molasses are separated in a few minutes. About 26 seers of *râb* are placed in a machine at once, the separation is effected in about 20 to 30 minutes, and the resulting sugar removed and the machine cleaned out ready for the next charge within five minutes. About 50 maunds of *râb* can be readily worked off in one day by each machine. The molasses are recovered quite clean and sweet, and are boiled down to form solid *gur*.

"The proportion of clean crystallized sugar (what is called *brown sugar* in England) which is obtained will, of course, vary somewhat with the nature of the *râb* operated upon. In one of Messrs. Thomson and Mylne's experiments a yield of 40 per cent. was obtained, in another 52 per cent. In two experiments which I made 48·8 and 51·9 per cent. was obtained.

"The amount of *gur* obtained after boiling down the molasses seems to vary between 25 and 40 per 100 of *râb* operated upon.

"The so-called 'turbine' or 'centrifugal' sugar is very fairly pure. I have analysed several samples, from which it appears that it contains from 90 to 95 per cent. of cane sugar, from ⅝ to 2 per cent. of glucose, from ½ to 3 per cent. of moisture, from ¾ to 1¼ per cent. of mineral matter, and from 2 to 3 per cent. of other (organic) impurities.

"The *gur* obtained by boiling down the molasses is quite as good as much of the *gur* which is made by the cultivators direct from the juice. Judging by the composition of some samples which I have examined, it appears to have about the following composition:—Cane sugar from 65 to 80 per cent., glucose from 5 to 14 per cent., mineral matters from 3½ to 4 per cent., water and other impurities from 10 to 20 per cent.

"In addition to a regular trade which has sprung up in the Sháhabad District in 'centrifugal' sugar, which is exported long distances by rail, a similar trade has arisen in the *gur* made from the molasses. I believe that a great future exists for this hand centrifugal machine, for it is clear that a very material economy in sugar must take place by its means over the native processes in which the greater part of the molasses becomes unfit for human consumption, and thus actually lost entirely, so far as food-supply is concerned.

"126. (7)—*The total amount of sugar in sugarcane and the amount remaining in the crushed refuse.*—Since it is obvious that by no process of simple crushing all the juice can be expressed from cane, it becomes an interesting question, how much is left with the refuse?

"The matter is of far greater importance than might at first sight appear. It has generally been assumed in India that everything related to the crushing process depends entirely on the mill, and the question of difference in the variety of cane has rarely, if ever, been considered.

"The first year's crushing of cane at the farms brought a very important fact to light. At Poona about 70 per cent. of juice was obtained from the cane there grown; at Cawnpore only about 50 per cent. was expressed. Since the mills which were used at the two places were essentially different, one might have said that the mills at Poona were infinitely better than those at Cawnpore. I knew, however, that such was not the case, some of the mills at Cawnpore having been of the very best workmanship and pattern.

"The difference between 50 and 70 per cent. of juice is so great that I decided to make some careful experiments in 1896 to find out what the true state of things really was. Accordingly, the total amount of sugar and of juice was determined in two lots of the Poona cane at Poona and in five different varieties grown at Cawnpore. The amount of juice expressed was also known, as well as amount of sugar in the latter, and the difference between the two gives the amount left in the crushed refuse cane.

"(It may be here mentioned that I found it impossible, for technical reasons, to determine the amount of sugar in the refuse *directly*. When working in the field out of reach of any laboratory, only certain appliances can be used, and I had therefore to be content with taking the *difference* figure above indicated as representing the quantity of sugar in the refuse.)

"The methods employed are sufficiently clearly set forth in paragraphs 11 to 13 of *Agricultural Ledger No. 19 of 1896.*

"The result of this investigation showed quite clearly on what factor depends the amount of juice which a good mill can express from sugarcane. The total amount of juice found in the two extreme cases examined varied from 85·2 to 91·5 per cent.; the amount expressed from 45·4 to 72·2 per cent. A comparison of these figures throws no light on the subject, for there is obviously no simple relation between the two cases, in one 45 out of a total of 85 and in the other 72 out of 91 per cent. of juice.

"If, however, another item in the composition of cane, namely, the *fibre*, be brought into the comparison, and its effect be considered, the cause of these variations in the amount of juice expressed becomes evident.

"It will be readily understood that, so soon as cane is crushed up by the mill and the cells opened, the only physical force which prevents *all* the juice from running out is that of adhesion. The fibre of the cane becomes, in fact, a spongy material, and just as it is impossible to press all the water out of a wet sponge, so likewise is it impossible to express all the juice out of cane.

"But the analyses of the several varieties showed further that *quite independently of the variety* the *crushed* refuse cane contained approximately always the same amount of juice. At Poona the crushed cane consisted of 70 to 71 per cent. of juice and 29 to 30 per cent. fibre; at Cawnpore, with entirely different mills and other varieties of cane, the refuse consisted of 72 to 75 per cent. of juice and 25 to 28 per cent. of fibre.

"Thus the proportion of juice in the crushed cane remained approximately constant, *i. e.*, the fibre of these different varieties held approximately the same amount of juice in each case. Referring again now to the instances already alluded to, in one of which a cane contained 85 per cent. of juice and yielded only 45 per cent. at the mills, and in the other the cane contained 91·5 per cent. juice and yielded 72 per cent. at the mills, if the amounts of crude *fibre* present in these canes be considered, its effect becomes apparent. The former contained 15 parts of fibre per 100 of fresh cane, and this 15 of fibre held 40 parts of juice, allowing only the other 45 parts to run out when pressed. In the second case, 100 parts contained 8·5 parts of fibre, and this 8·5 parts of fibre held 19·5 parts of juice, allowing the *remaining* 72·2 parts to run out when pressed. And, as a result of this investigation, it may be said that, even with the best of mills, each part of fibre in the fresh cane will hold twice to two and a half times its own weight of juice when pressed, and allow only the surplus to run out.

"It becomes, therefore, an all-important matter in the selection of varieties of cane to choose those which contain low proportions of crude fibre. Speaking generally of varieties, I have found it almost uniformly the case that the small varieties commonly grown for crushing purposes in the North-Western Provinces and Behar contain high proportions of crude fibre, and yield only some 50 to 55 per cent. of juice at the mills. On the other hand, the thick canes, some varieties of which are grown for chewing in the North-Western Provinces, others for crushing in Bengal and the Deccan, contain uniformly low proportions of crude fibre, and yield from 65 to 70 per cent. of juice at the mills.

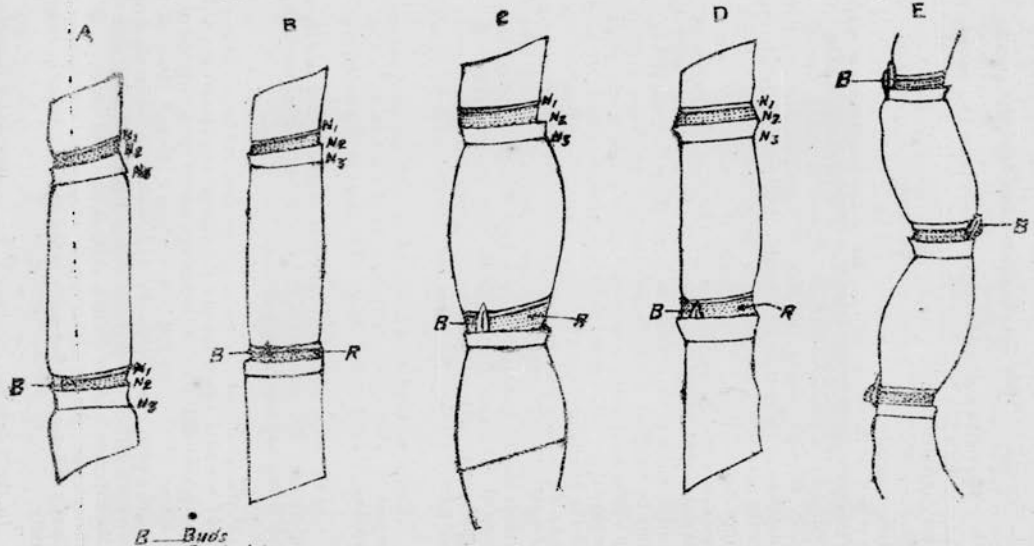
"Thus, even assuming that the juice of the thin varieties is just as rich in sugar as that of the thick ones (and it is probable that it is not so rich), the introduction of thick varieties in place of thin ones would mean a direct gain in sugar production of about 25 to 30 per cent. over that at present obtained, and this without any further expenditure on manure, water, etc.

"127. (8)—*The amount of phosphoric acid and nitrogen in the sugarcane crop.*—At Poona the cultivators employ very large amounts of manure for this crop, and it has been further demonstrated by the field experiments that whilst it may be the case that these amounts are somewhat larger than necessary, very heavy dressings of manure *are* desirable, and will readily repay the initial cost. So far as one can draw any conclusion from the three years' experiments, it would appear that 500 lbs. of nitrogen per acre should be given in order to obtain a full crop. The amount of phosphoric acid required is still quite uncertain. Since it is necessary to apply such large amounts of manure, it seemed desirable to gain a knowledge of the amount of these plant-foods which are extracted from the soil by cane crops generally, and I made several determinations to this end. The cane, green tops, and dry leaves of crops at Cawnpore and Dumraon were weighed, and portions of each submitted to analyses. The results obtained showed that in crops weighing 60,000 to 70,000 lbs. there was generally contained some 50 to 60 lbs. of nitrogen and the same amount of phosphoric acid. The crops at Poona are fully twice as heavy as this and it may therefore be said that they remove 100 lbs. or more of each of these plant-foods. There is consequently a considerable balance unaccounted for. I have examined the results of the analyses of the Poona (Mánjri) farm soils, and, judging by these, this balance of plant-food is still in the soil, and no material amount has been lost by drainage up to the present.

"128. *Concluding remarks.*—As to the general importance of experiments on the sugar-cane crop, it is almost unnecessary for me to say anything. It is clear in the first place that so long as India has to import sugar (the net amount is about 75,000 tons annually), there is room for an increased production. It is also clear that, whilst an article of diet, which is common to the people generally, is imported, the cost of production is higher than it should be. But this is not all, for the greater part of the sugar produced goes to the cities, and it thus becomes in a measure a luxury. Then, too, there is the difference between the outturn per acre as realised in the Deccan and Bengal on the one hand, where, with good varieties and good methods of cultivation, some 2½ to 4 tons of raw sugar is obtained, and in Behar and the North-Western Provinces on the other, where the outturn is certainly not more than 1 to 1½ tons per acre, and is often much less.

"As has been shown in the course of this section of my report, there is no need to go outside of India for good varieties, nor to other countries for good methods of cultivation. The best of varieties are met with; and the methods of cultivation in some parts are very perfect. What is wanted is the introduction of these good varieties and good methods into those parts, particularly the North-Western Provinces and Behar, which Provinces, it must be recollected, include much the largest area under cane of any Provinces of India."

DIAGRAM SHOWING DIFFERENT TYPES OF CANE.



B—Buds
R—Root dots
N_1, N_2, N_3—Nodes.

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DESCRIPTION OF VARIETIES OF SUGARCANE.

(By Dr. Leather and Mr. Mollison.)

The following notes contain a description of a number of varieties of sugarcane which have been examined. It is possible that some of these are cultivated in other parts of India; doubtless also there are many other varieties which still remain to be described, and the writers think that the following introductory remarks will be of assistance to other agriculturists, not only in the recognition of varieties included in these notes and growing elsewhere, but that they will admit of descriptions of other varieties being reduced to a common standard. It must be stated, however, at the outset that, although among varieties of sugarcane each possesses particular markings or colours (to be presently dealt with in detail) there is usually in the case of any one particular variety considerable latitude within which appearances vary. For example, if a number of canes of the *madrâsi pounda* of the North-Western Provinces or the *pundia* of Poona or the *samsâra* of Burdwan be examined, it can be at once seen that the colour varies in any of these varieties from green to straw yellow, but the colour may be modified, so that some canes may be almost entirely green, whilst in others some portions may be entirely yellow or the yellow may have an orange tinge. The latter tinge is particularly noticeable on canes growing on the headlands and, therefore, rather fully exposed to the sun. In the *madrâsi pounda* this orange yellow colour is sometimes the general colour of the whole cane. The same variety may vary in shape between the nodes; a cane may be generally of, say, type A (*vide diagram at page* 136), but some of the canes in the bundle may possess shape of type C more especially at the lower end; or, again, a cane may have grown in type E at one part (frequently the upper end), the remainder being straight.

Correspondingly great variations will be found among varieties in respect of other particulars, such as the extent to which aërial roots develope, the colour and shape of the rings at the nodes, etc.

At the same time each variety *is* distinct, and when canes of two varieties are placed together, the differences become much more apparent than if they are separately examined.

Occasionally no differences can be detected between the striped canes of two varieties. For example, the *mungo* and *bhurli* canes of Behar are so much alike that they are indistinguishable when stripped of the leaves; the leaves of the two are, however, quite distinct, those of the *mungo* being of a paler green and inclined to crumple up, whilst those of the *bhurli* variety are darker in colour and remain flatter. Such a case is, however, in the experience of the writers, exceptional, and varieties, as a rule, are sufficiently distinct to enable one to recognize them without the leaves. In fact, the leaves are commonly of but little assistance in determining the variety.

In the following paragraphs the points which have been more particularly examined are dealt with in detail.

Colour. Sugarcane may be of the following colours :—

(1) Pale yellow or drab.
(2) Pale yellow and green.
(3) Nearly entirely green.
(4) Purple or purple red.
(5) Purple and yellow green in stripes.
(6) A more or less intimate mixture of dull purple and dull green, best described as a dirty colour.

Of these, however, only (4), (5) and (6) are really so distinct that the cane can be definitely said to belong to the one or the other. A striped cane, for instance, is always striped purple with yellow or yellow green. A cane that might be classed as wholly purple, when minutely examined, may or may not have longitudinal stripes of a darker or lighter colour, these being most distinctly marked on the upper inter-nodes and only faintly marked on the lower. In purple canes the depth of colour may vary from very dark purple to a light reddish purple. It is at times practically impossible to decide whether a particular cane should be classed as pale yellow or drab, or pale yellow and green, and again it is hard to differentiate between pale yellow and green and nearly entirely green. It has been found that some varieties are almost or quite destitute of green in a certain field, *e.g., betta kabbu* at Belgaum and *dhaur* and *rákra* in the North-Western Provinces; but tinges of green are frequently found on the same variety when cultivated under other conditions, *e.g., betta kabbu,* which at Poona had tinges of green on it. The same may be said of canes being all green. Sometimes a variety will be quite destitute of yellow in a certain field, but the same variety will be found in another field or locality to be quite yellow in places. For example, the *mungo* at Rosa was entirely green, whilst at Bára Banki it was partly yellow. The simplest plan is, therefore, to class all canes of a yellow or yellowish green or green colour together, and state the colour as found in a particular variety when examined.

Canes might then be divided into four classes as regards colour, namely :—

(1) Yellow or green or both.
(2) Purple.
(3) Purple and yellowish green in stripes.
(4) Purple and green mixed to form a dirty colour.

It not infrequently happens that a yellow green cane will have very distinct patches of red or pink upon it. Such, for example, is the *rámwie* of Sitápur District, North-Western Provinces. But this is quite distinct from the purple colour of canes belonging to classes 2 and 3.

Other points of colour. In reference to the colour of canes, several other points are deserving of notice.

Very frequently patches or smudges of dirty black are found adhering to a cane. This is quite external, and may readily be rubbed off. It cannot be said that these smudges are characteristic; they are found on some varieties, not on others, growing in the same field, and the origin of the smudges has not been determined. Then tinges of pink or red appear on some canes, especially just above the nodes where the leaf still adheres. This colour is not always on every cane of one variety in the

same field, but is apparently a *common* characteristic on some varieties. For instance, the *rámwie* cane of the North-Western Provinces was tinged with pink at Sitápur (Oudh) and in one of the fields examined at Bára Banki (Oudh), but in another field of this variety at Bára Banki this colour was almost entirely absent.

Bloom.

There is on some varieties a mass of waxy bloom which covers the cane more or less, and the presence or absence of this bloom, as also the degree to which it covers a cane, seems to be quite characteristic of varieties.

General shape.

Sugarcanes have very characteristic shapes, some of the principal ones being depicted in the diagram on page 136 and shown as A, B, C, D and E. Of these the first three are perhaps the most common.

A—represents one which has distinct contraction at the nodes, but is otherwise a cane of practically uniform thickness.

B—represents a cane which is practically of uniform thickness throughout its length, there being no perceptible contraction or expansion at the nodes.

C—represents a cane which is contracted at the nodes, and becomes distinctly enlarged between the nodes.

D—represents one in which the nodes are distinctly larger than the cane, and it then becomes narrower between the nodes. This apparently is not a common shape.

Finally, E—represents a cane which has a zigzag form from joint to joint.

Colour of nodes.

The nodes of canes are very characteristically coloured or marked. There are always two bands—one immediately above the node marked N_3 in the diagram. This is about as broad as the buds are long *before they commence to grow*; also it is from this band that the roots develope either as aërial roots or when cane sets are planted. The little dots or growing points of the future roots are always perceptible. In some varieties they are much more distinct than in others. In fully mature canes the root dots of the lower nodes present a roughened appearance as if the roots had started to grow. At the upper nodes they present a smooth surface. The colour of the root dot band varies, but is generally lighter coloured than the main part of the cane. Immediately *below* the node is another band, marked N_3 in the diagram, of about the same breadth as the upper one. This band is generally of a grayish or bluish grey colour, occasioned partly by the coating of wax which is invariably present on this part of a cane, however little wax may be attached to other parts. The grey colour commonly terminates suddenly, thus making a very distinct band; it sometimes, however, extends downwards on the main part of the cane, and only gradually changes to the general colour of the cane. Such is the case, for example, on some canes of *hullu kabbu* of Belgaum.

Shape of band.

The shapes of these two bands also vary. Sometimes the cane is contracted at both bands, but more commonly the contraction is only slight at the upper one, but considerable at the lower one. The different types of nodes are

graphically represented in the diagram, of which A, B and C are very common. In addition to these, there is a ring marked N_1 in the diagram, which is common to many varieties, but almost, if not quite, absent in the case of others. The ring, if distinct, is about $\frac{1}{16}''$ wide, and is commonly of a decided orange colour. Very frequently, however, it is not uniformly distinct in any one variety, and not of uniform width or prominence on all the nodes of the same variety.

Buds.

The buds vary in shape, size and colour among varieties, but since their shape and colour vary according to whether they have commenced to grow or not, care must be taken to notice this point in examining them. At the same time on some varieties (if not over-ripe) they are uniformly rounded or oval, whilst in the case of others they are more pointed. In some varieties the scalelike covering which protects the buds is coarse and fibrous in texture ; in others it is smooth, thin and shining.

Root dots.

Regarding the little dots indicating the seat of the growing point of the future root, not much need be said. They are distinct on some varieties, but only just perceptible on others.

Aerial roots.

Sugarcanes have a general tendency to throw out aerial roots *from the nodes which are near the ground*, but some varieties produce them, not only close to the ground, but for some distance up the cane. Occasionally this is a very pronounced characteristic. For example, the *shâhâranpuri* and the *madrâsi* or *madrâsi pounda* of the North-Western Provinces and the *samsâra* of Bengal frequently produces them over its entire length, and, moreover, the aërial roots of one node grow towards and join those of the next node.

Girth.

The girth of canes varies apparently, not only between varieties, but also according to the perfection of growth of the variety. Generally, however, it may be said that the girth of a thin specimen of any one variety will not be less than $\frac{3}{4}$th of that of a really good specimen of that variety. For this reason the girth of a cane is a most important consideration. If an unknown variety has a general thickness of $2''$ but is similar in other points to one having a general girth of $4''$, it may be said with certainty that they are different varieties. The girth of some varieties is almost uniform throughout the entire length. On the other hand, sometimes canes are thinner at the top end than at the bottom, and less frequently they are thinner at both ends than in the middle.

Length between nodes.

The length between the nodes of a cane varies *very* considerably, but nevertheless well grown canes of all varieties appear to be characterised more or less in this particular.

The *hullu kabbu* of Belgaum, for example, has generally long inter-nodes, whilst the *betta kabbu* of Belgaum has frequently short ones. The *malabâri* cane of Surat has generally long inter-nodes. The *meva* cane of the same district has invariably short inter-nodes. If a crop of cane of any variety is stunted in growth for want of manure or any other cause, the inter-nodes are invariably short.

General remarks.

But although such broad distinctions as the above may be made between canes generally, it is not always easy to decide to which variety a cane belongs. The shape of canes and their colours merge in a measure the one into the other.

In the case of colour, any cane may be easily placed under one of the four groups which have been suggested; but in the case of the colour and distinctness of the bands of the nodes, whether the ring (marked N_1 in the diagram) is distinct or not, whether a cane is enlarged or contracted between the nodes, etc., whether aerial roots are common to a variety, what the shape of the buds is, etc., etc., it is frequently difficult to say positively what would be an accurate description for any one variety. Nevertheless, if, in describing canes, the various points be noted on the above indicated lines, descriptions given by different persons of the same variety would probably agree more completely than if such descriptions were referred to no general standard.

Vernacular names.

That the cultivators can recognise the varieties of their particular district there is not the least doubt, and if they all spoke the same tongue, the recognition of the many varieties grown in India would be a very simple matter. Unfortunately, the names given by the people are not always of much value.

In the North-Western Provinces and Oudh not much difficulty has been experienced in this respect.

In the Southern Marátha Country, however, much confusion exists among the names, as the following instances will show. There are three thick canes grown, one being a green yellow cane (the *pundia* of Poona), a second is entirely purple, and the third is striped purple and yellow green.

The *pundia* is called *pundia* throughout the Southern Marátha Country, but it is also called *bile kabbu* (*i.e.*, white cane) and *rasdáli kabbu* at Dhárwár. The purple cane is generally called *káre kabbu*, but is also called *rasála kabbu* in some villages. The striped cane is called *rasála*, *rasáli*, *rasváli* or *rámrasdáli*.

When one enquires into the meaning of these words, the cause of the confusion becomes apparent. *Bile* means "white," and is doubtless applied by the people to that variety of the three which is yellowish green in colour (that is, lightest in colour) to distinguish it from the purple ones.

Rasála or *rasvála* or *rasdáli*, all of which are probably the same words differently pronounced, means juicy, and the term is applied to all the three varieties, because they are more juicy than the thin varieties also grown in the Southern Marátha Country.

In the name *rámrasdáli*, the prefix *rám* is derived from *rám* = God, and is probably applied to the striped cane, because it is the prettiest of the three.

In finding the different varieties of cane in a district, the cultivators have been found of the greatest assistance to the writers; they will

readily indicate the fields in which the different varieties are grown, and the measurements and other descriptive remarks may then be made without any trouble.

Juice of canes.

The foregoing has only reference to the appearance and size of canes. It remains to say a word with regard to the juice.

The percentage of juice obtainable in the iron mill from any variety is apparently fairly constant. (*Vide*, for example, the varieties grown at Belgaum and Dhárwár described further on.)

So far as the experience of the writers goes, thick canes will give from 68 to 72 per cent., while from thin ones only 50 to 60 per cent. will be obtained. Consequently, it is most important to find out if this rule may be relied upon. The subject is dealt with more fully in *Agricultural Ledger No. 19 of 1896* at pages 18 to 20. The proportion of juice extractable may be readily determined by passing about 100 lbs. of cleaned cane of any one variety through an iron mill and weighing the *juice* obtained. The percentage of sugar in the juice can be approximately determined from the specific gravity, and this subject has been dealt with in a special paper on the chemical composition of sugarcane. (*Agricultural Ledger Series No. 3 of 1897.*)

Varieties of cane examined.

DETAILED DESCRIPTION OF DIFFERENT VARIETIES OF SUGARCANE.

(A).—Bombay Presidency Varieties.

(*Examined by* Mr. Mollison.)

Khajuria or meva.

Variety—Khajuria or *meva.*

Where grown—Surat District.

General appearance—A yellow green cane of medium thickness; tall and fairly soft; used only for raw eating; tillers freely; ratoons well; grows in clumps.

Type—C; inter-nodes only slightly bulged.

Bloom—A little.

Nodes—Ring N_1—Not distinct.

Band N_2—Irregular in shape; yellow or cream colour; root dots well marked.

Band N_3—Well defined; blue grey colour.

Height—About 6 feet without tops when well grown.

Girth—$3\frac{1}{4}$" to $3\frac{3}{4}$"; almost uniform from root to top.

Inter-nodes—$2\frac{1}{2}$ to 3 inches; characteristically short.

Aerial roots—On three or four nodes near root only.

Buds—Very prominent; rounded; sharp point; covered with shining scale-like covering, except on lower nodes, where the covering is brown and fibrous.

Dr. Leather's *Analysis*—

	Poona Farm Crop.	
	1896. (Fresh Imports.)	1897. (Acclimatized 1 year.)
Percentage of juice to cane	... 59·15	67·25
Do. of sugar to juice	... 10·98	14·80
Do. of glucose in juice	... 1·40	1·00

Malabári.

Variety—Malabári.

Where grown—Surat District.

General appearance—A fairly thick, tall, soft cane; yellow green colour; cane generally somewhat bent at top end; does not ratoon well.

Type—C; inter-nodes fairly bulged.

Bloom—Very little.

Nodes—Ring N_1—Indistinct on lower nodes; fairly well marked on upper nodes; pale yellow and green; root dots well marked.

Band N_2—Yellow and green; root dots well marked.

Band N_3—Light, blue-grey colour.

Height—7½ to 9 feet without tops when well grown.

Girth—4″ to 4¾″.

Inter-nodes—3½″ to 5½″.

Aerial roots—On three or four lower nodes only.

Buds—Very small; covered with fibrous dull brown covering.

Vánsi or bamboo; betta kabbu.

Variety—Vánsi or bamboo, same as *betta kabbu* of Southern Marátha Country.

Where grown—Surat and Belgaum Districts.

General appearance—A cream coloured or light yellow cane; vertically scored with black or brown lines; very tall; thin and hard; of uniform thickness throughout; the leaves are narrow and long, and the dried dead leaves enclose the cane, and thus protect it from damage by jackals and pigs.

Type—B.

Bloom—Good deal; black patches numerous.

Nodes—Ring N_1—Distinct dull yellow colour.

Band N_2—Regular in width; cream colour; root dots not numerous and not distinctly marked.

Band N_3—Not well marked; light grey colour; sometimes nearly white.

Height—Without tops 8 feet; some canes 10 feet long when well grown.

Girth– 2½" to 3¾".

Inter-nodes–3½" to 5".

Aerial roots—On four to six lower nodes.

Buds—Rounded; small; not prominent; shining light green scale covering on upper and brown or *khâki* scales on lower buds.

Dr. Leather's *Analysis* –

	Belgaum Crop (*betta kabbu*).	Poona Farm Crop (bamboo or *vânsi*).	
	1896.	1896.	1897.
	(Local.)	(Fresh Imports.)	(Acclimatized 1 year.)
Percentage of juice to cane ...	60·00	57·70	59·09
Do. of sugar to juice ...	12·64	9·53	14·50
Do. of glucose in juice...	0·95	1·54	1·00

Bhuri.

Variety—Bhuri.

Where grown– Surat District.

General appearance—A fairly tall, moderately thick, hard cane; the colour varies between the lower and upper inter-nodes considerably; the lower ones are a dirty looking admixture of brown, dull purple, and dull green; the upper nodes are dull purple, mixed with a good deal of dull green; the canes are mostly scored or blotched with grey.

Type—E; only slightly zigzag in shape.

Nodes–Ring N_1—Not very distinctly marked.

Band N_2—Not distinctly marked, but varies with the cane in colour between upper and lower nodes; root dots very prominent.

Band N_3—Hardly observable in lower nodes; a ring of grey bloom on upper nodes.

Height—Without tops 6 to 7 feet when well grown.

Girth—3½" to 3¾".

Inter-nodes—3½" to 4½".

Buds—Fairly large; flattened; pointed; covered with fibrous *khâki* coloured scales.

Aerial roots—On lower nodes.

Phojbhuri.

Variety Phojbhuri.

Where grown—Surat District.

General appearance—Very like *bhuri* in appearance, excepting that the colour is yellow green on upper inter-nodes, but irregularly tinged here and there, with brown and purple on lower inter-nodes.

Type E; only slightly zigzag in shape.

Bloom—A little.

Nodes—Ring N_1—Faintly marked.

Band N_2—Irregular in width; yellow or green in colour; root dots fairly distinctly marked.

Band N_3—Faintly marked on lower nodes, but more distinctly on upper ones; blue grey colour.

Height—6 to 7 feet when well grown.

Girth—$3\frac{1}{2}$" to 4".

Inter-nodes—$3\frac{1}{2}$" to $4\frac{1}{2}$".

Buds—Medium size; flat; pointed; covered with *kháki* coloured scales.

Aerial roots—On lower nodes.

Songadi.

Variety—Songadi.

Where grown—Surat District.

General appearance—A dull purple, mixed with dull green; scored irregularly with *kháki* coloured marks; this cane is tall, hard and nearly of uniform thickness throughout the whole length.

Type—E.

Bloom—None.

Nodes—Ring N_1—Very wide and irregular in shape; varies in colour, generally purple.

Band N_2—Irregular in shape and colour; root dots distinct and lighter in colour; thin band.

Band N_3—Regular in shape, but varies in colour throughout the length of the cane in a very erratic manner.

Height—8 to 10 feet without tops when well grown.

Girth—$3\frac{1}{2}$" to 4".

Inter-nodes—5" to 6".

Aerial roots—On lower nodes only.

Buds—Fairly large, flat, pointed, and *kháki* coloured.

Káli jádi.

Variety—Káli jádi.

Where grown—Surat District.

General appearance—A tall, hard cane of almost uniform thickness from root to top; dull purple in colour; scored and blotched with *kháki* colour.

Type—E; but inter-nodes only slightly zigzag.

Bloom—A little.

Nodes—Ring N_1—Indistinct on lower nodes; distinct and yellow green colour on upper nodes.

Band N_2—Purple with faintly marked root dots on lower nodes; pale green on upper nodes.

Band N_3—Distinct band of blue grey bloom.

Height—6 to 7 feet when well grown.

Girth—$3\frac{1}{2}''$ to $4''$.

Inter-nodes—$4''$ to $4\frac{1}{2}''$.

Aerial roots—Very few.

Buds—Small, flat, blunt, and *khâki* coloured .

Deogadi.

Variety—Deogadi.

Where grown—Ratnágiri District.

General appearance—A very tall, straight, fairly thick cane ; moderately hard; smooth ; yellow and pale green in colour.

Type—A ; inter-nodes very slightly bugled.

Bloom—Very slight.

Nodes—Ring N_1—Distinctly marked ; very regular in width ; narrow ; varies in colour, mostly deep yellow.

Band N_2—Very regular ; distinctly marked ; green yellow in colour ; root dots numerous and very distinct.

Band N_3—Grey blue in colour and very distinct.

Height—7 to 8 feet without tops ; very well grown canes over 10 feet without tops.

Girth—$3\frac{1}{2}''$ to $4\frac{1}{4}''$; middle inter-nodes slightly thicker than lower and upper ones.

Inter-nodes—$3\frac{1}{2}''$ to $5\frac{1}{2}''$.

Aerial roots—None.

Buds—Small, rounded, fairly sharp points ; covered with a shining scale covering ; varies in colour.

Dr. Leather's *Analysis*—

	Poona Farm Crop.	
	1896. (Fresh Imports.)	1897. (Acclimatized 1 year.)
Percentage of juice to cane ...	70·50	68·0
Do. of sugar to juice ...	11·46	14·9
Do. of glucose in juice ...	1·87	0·9

Máhim yellow-green ; *pundia.*

Variety—Máhim yellow-green ; same as Poona *pundia* and *pundia* of Belgaum, etc.

Where grown—Máhim, Thána District.

General appearance—A thick, soft, tall cane, tapering to small inter-nodes at the top ; yellow green in colour; cane generally bent or crooked.

Type—C ; inter-nodes bulged considerably, especially at the top end ; cane much inclined to crack vertically before ripening like all soft thick varieties ; ratoons well.

Bloom—Good deal.

Nodes—Ring N_1—Irregular; not particularly noticeable; orange.

Band N_2—Wide and irregular in shape; yellow or yellowish green; root dots numerous and easily seen.

Band N_3—Wide; distinct; blue-grey in colour.

Height—7½ to 9 feet without tops; some canes 10 feet long.

Girth—4½″ to 5″.

Inter-nodes—3½″ to 5″.

Aerial roots—Few or none.

Buds—Rounded, prominent, moderate in size; covered with dull brown or *khâki* fibrous covering.

Dr. Leather's *Analysis*—

	Poona Farm Crop.			Belgaum Crop.
	(Máhim Yellow green.)		(*Pundia.*)	(*Pundia.*)
	1896. (Fresh Imports.)	1897. (Acclimatized 1 year.)	1896. (Local.)	1896 (Local.)
Percentage of juice to cane ...	71·00	70·58	68 to 73	68 to 73
Do. of sugar to juice ...	12·38	14·80	16 to 17·4	13·71 to 17·49
Do. of glucose in juice .	1·87	0·80	1·2 to 1·6	0·83 to 1·57

Variety—Green Mauritius.

Green Mauritius.

Where grown—Imported in 1893 by the Bombay Agricultural Department.

General appearance—A tall, moderately thick, fairly hard cane; lower inter-nodes green; colour changes gradually towards the top to a pale yellow tinged with green; cane flowers freely and inclined to produce side shoots prematurely; it tillers and ratoons well.

Type—A.

Bloom—None.

Nodes—Ring N_1—Well marked; rather wide; much the same colour as the cane.

Band N_2—Mostly pale yellow, tinged with green; regular in width; root dots fairly well marked.

Band N_3—Distinct; light blue grey in colour.

Height—7 to 7½ feet without tops.

Girth—3½″ to 4″.

Inter-nodes—3½″ to 4½″.

Aerial roots—Few or none.

Buds—Round; fairly prominent; slightly pointed; covered by a light *khâki* fibrous covering.

Dr. Leather's *Analysis*—

	Poona Farm Crop.	
	1896.	1897.
Percentage of juice to cane ...	65·70	68·75
Do. of sugar to juice ...	14·71	14·10
Do. of glucose in juice ...	0·99	1·40

Rasdáli; rasváli; rasáli.

Variety—Rasdáli; *rasváli*; *rasáli*; that is, juicy.

Where grown—Haliyál, Kánara District.

General appearance—A tall, fairly hard, yellow green cane of moderate thickness.

Type—A.

Bloom—Little or none.

Nodes—Ring N_1—Distinct; narrow; varies in colour; mostly green or yellow.

Band N_2—Wide; fairly regular in width; roots dots numerous and distinct.

Band N_3—Wide; distinct; blue grey in colour.

Height—7 to 7½ feet without tops when well grown.

Girth—3¼″ to 3¾″.

Inter-nodes—5″ to 6″.

Buds—Small; prominent; rounded; covered by brown or *kháki* scales.

Dr. Leather's *Analysis*—

	Poona Farm Crop.	
	1896. (Fresh Imports.)	1897. (Acclimatized 1 year.)
Percentage of juice to cane	60·40	62·14
Do. of sugar to juice	13·18	15·30
Do. of glucose in juice	1·49	1·00

Yellow green.

Variety—Yellow green.

Where grown—Bijápur, Bágalkot, Bijápur District.

General appearance—A yellow green cane; fair in length and thickness; slightly scored with brown; lower inter-nodes not so thick as those in middle of cane.

Type—A, sometimes C; internodes very slightly bulged.

Bloom—A little.

Nodes—Ring N_1—Distinctly marked in upper nodes, but not so distinct on the lower ones; varies in colour, but commonly part of ring bright brown.

Band N_2—Distinctly marked; pale green and yellow in colour; root dots very distinctly marked.

Band N_3—Very distinct and regular; of blue grey colour.

Height—8 to 8½ feet without tops when well grown.

Girth—4″ to 4½″.

Inter-nodes—Very regular, in length 4½″ to 5″.

Aerial roots—None.

Buds—Small; rounded; pointed; covered with *kháki* coloured scales.

Dr. Leather's *Analysis*—

	Poona Farm Crop. (Bijápur Yellow geen.) 1896. (Fresh Imports.)	1897. (Acclimatized 1 year.	(Bágalkot Yellow green.) 1896. (Fresh Imports.)	1897. (Acclimatized 1 year.)
Percentage of juice to cane ...	70·40	70·62	68·40	68·75
Do. of sugar to juice ...	14·30	16·60	12·34	16·20
Do. of glucose in juice .	1·57	1·10	1·94	1·40

Hullu kabbu.

Variety—Hullu kabbu (*hullu* = grass and *kabbu* = sugarcane).

Where grown—Southern Marátha Country.

General appearance—A very thin, tall, hard cane; yellow green in colour; generally bent towards the top; many dirty patches; cane securely enclosed in dead side leaves; tillers freely; ratoons well.

Type—Generally B.

Bloom—Good deal.

Nodes—Ring N_1—Orange yellow, tinged with green on upper nodes.

Band N_2—Dull yellow; root dots distinct.

Band N_3—Grey.

Height—7 to 8 feet; some canes 10 feet without tops when well grown.

Girth—$1\frac{3}{4}$″ to 2″.

Inter-nodes—5″ to 7″.

Aerial roots—A few on lower nodes only.

Buds—Slightly prominent; elliptical; lower buds covered by brown scales; upper ones light green in colour.

Dr. Leather's *Analysis*—

	Poona Farm Crop. 1896. (Fresh Imports.)	1897. (Acclimatized 1 year.)	Belgaum Crop. 1896. (Local.)
Percentage of juice to cane ...	52·60	56·17	55·90 to 59·80
Do. of sugar to juice ...	16·06	16·90	14·27 to 14·92
Do. of glucose in juice.	A trace only.	0·70	A trace to 0·74

Yellow-green.

Variety—Yellow-green.

Where grown—Ránebennur, Dhárwár District, and Chikodi, Belgaum District.

General appearance—A light green or yellow cane; moderately thick; fairly tall and soft.

Type—A, sometimes C; inter-nodes slightly bulged; nodes not prominent.

Bloom—Some.

Nodes—Ring N_1—Distinctly marked; narrow; dull orange brown in colour, which, however, varies in lower nodes.

Band N_2—Distinctly marked; wide; root dots distinct and numerous.

Band N_3—Distinct; wide; dull grey in colour.

Height—6½ to 7 feet without tops when well grown.

Girth—3″ to 4″.

Inter-nodes—3″ to 5″.

Aerial roots—None.

Buds—Small; round or oval; blunt; covered by dull *khâki* scale-like covering, which gets fibrous on lower buds.

Dr. Leather's *Analysis*—

	Poona Farm Crop.		
	(Chikodi Yellow-green.)		(Ránebennur Cane.)
	1896. (Fresh Imports.)	1897. (Acclimatized 1 year.)	1896. (Fresh Imports.)
Percentage of juice to cane ...	65·50	68·47	64·10
Do. of sugar to juice ...	11·35	14·90	12·04
Do. of glucose in juice.	1·80	1·90	1·48

Sanna bile kabbu.

Variety—*Sanna bile kabbu* (*sanna* = small, *bile* = white, *kabbu* = sugarcane).

Where grown—Khánápur, Belgaum District; Southern Marátha Country.

General appearance—A tall, straight yellow cane, tinged irregularly with pale green with vertical red brown scores on lower end; characteristic bright orange red colouring on leaf sheats of upper leaves; dry leaves closely enclose the cane; many dirty patches on cane; tillers freely and ratoons well.

Type—B.

Bloom—A little.

Nodes—Ring N_1—Very distinct; deep yellow; fairly narrow.

Band N_2—Cream colour; well marked; root dots fairly distinct.

Band N_3—Distinct; light blue grey colour.

Height—8½ to 10 feet without tops when well grown.

Girth—3¼″ to 4″; uniform.

Inter-nodes—4″ to 4½″.

Aerial roots—Hardly any.

Buds Small, rounded, and prominent; lower buds *khâki* coloured upper buds pale yellow and green.

Dr. Leather's *Analysis*—

	Poona Farm Crop.		Khánápur Crop.
	1896. (Fresh Imports.)	1897. (Acclimatized 1 year.)	1896. (Local.)
Percentage of juice to cane ...	60·00	58·20	58·20
Do. of sugar to juice ...	17·38	16·00	13·31
Do. of glucose in juice ...	0·68	0·90	1·09

Variety—Red or *Purple Mauritius.*

Red or purple Mauritius.

Where grown—Imported in 1893 by the Bombay Agricultural Department.

General appearance—A tall, thick, hard cane; general colour purple or bright purple on lower inter-nodes; the colouring gets lighter and brighter towards the upper inter-nodes; distinct, almost black, vertical stripes in most of the inter-nodes resembling streaked cane; the cane has a shining appearance; leaves sometimes variegated in colour; tillers freely; inclined to flower, also to produce side shoots prematurely.

Type—A.

Bloom—None.

Nodes—Ring N_1—Very distinct and, except in lower nodes, of cream colour.

Band N_2—Colour variable, but always lighter than the general colour of the cane; mostly dull yellow, irregularly tinged with red or purple; root dots very distinct; each dot surrounded by a light coloured circle.

Band N_3—Very distinct; dull blue grey in colour.

Height—8 to 9 feet without tops.

Girth—4″ to 4½″; uniform.

Inter-nodes—4½″ to 6″.

Aerial roots—Few or none.

Buds—Small; round; covered by a shining scale covering; light colour on the upper nodes and dull purple on the lower one.

Dr. Leather's *Analysis*—

	Poona Farm Crop. 1896.	1897.
Percentage of juice to cane	66·75	65·47
Do. of sugar to juice	12·88	12·50
Do. of glucose in juice	1·62	1·20

Variety—Purple cane.

Purple cane.

Where grown—Bijápur District; Bassein, Thána District.

General appearance—A fairly tall and moderately thick cane; lower inter-nodes dull purple, irregularly scored vertically with dull *khâki* colour; upper inter-nodes lighter in colour, with a streaked appearance; slightly resembling streaked cane.

Type—E.

Bloom—None.

Nodes—Ring N_1—Indistinct; of variable colour; upper nodes pale yellow; lower ones dull purple.

Band N_2—Pale yellow in upper nodes; pale dull and brown and purple in lower ones.

Band N_3—Very distinct; light blue grey in colour.

Height—7 to 8 feet without tops when well grown.

Girth—$3\frac{1}{2}''$ to $4''$; lower inter-nodes considerably smaller in diameter than the middle ones.

Inter-nodes—$3\frac{1}{2}''$ to $5''$.

Aerial roots—Very few or none.

Buds—Narrow; long; pointed; covered with fibrous scale-like covering; upper buds inclined to shoot early.

Dr. Leather's *Analysis*—

	Poona Farm Crop.			
	(Bijápur Purple Cane.)		(Bassein Purple Cane.)	
	1896. (Fresh Imports.)	1897. (Acclimatized 1 year.)	1896. (Fresh Imports.)	1897. (Acclimatized 1 year.)
Percentage of juice to cane ...	63·00	62·50	57·10	64·80
Do. of sugar to juice ...	13·27	13·80	13·31	13·60
Do. of glucose in juice ...	1·33	1·00	1·22	1·70

Káre kabbu.

Variety—*Káre kabbu* (*káre* = black, *kabbu* = sugarcane).

Where grown—Belgaum, Khánápur, Belgaum District; Ránebennur, Dhárwár District.

General appearance—A dark purple cane of fair length and moderately thick; the general colour is tinged with green towards top, where cane is immature; ratoons fairly well.

Type—E, but only slightly zigzag.

Bloom—None.

Nodes—Ring N_1—Distinct; varies in colour similarly to Band N_2.

Band N_2—Light purple or yellow green at upper end of cane; purple at lower end; root dots distinct.

Band N_3—Blue grey.

Height—6 to $7\frac{1}{2}$ feet without tops when well grown.

Girth—$3\frac{1}{4}''$ to $3\frac{3}{4}''$.

Inter-nodes—3 to 4.

Buds—Dull *kháki* or light brown in colour; medium in size; oval.

Dr. Leather's *Analysis*—

	Poona Farm Crop.			Belgaum, Khánápur and Ránebennur Crop.
	(Belgaum Cane.) 1896.	(Khánápur Cane.) 1896.	(Ránebennur Cane.) 1896.	(Local.) 1896.
Percentage of juice to cane ...	60·70	63·00	54·40	60·70 to 66·00
Do. of sugar to juice ...	11·67	6·13	10·27	13·32 to 16·67
Do. of glucose in juice.	1·54	2·57	1·60	0·85 to 1·17

Rámrasdáli.

Variety—*Rámrasdáli.*

Where grown—Haliyál, Kánara District.

General appearance—A fairly tall soft cane; uniform in thickness; irregularly streaked with dull purple and pale green streaks, varying very irregularly in width; ratoons fairly well.

Type—A and E combined; only slightly zigzag; inter-nodes slightly bulged sometimes.

Bloom—A little.

Nodes—Ring N_1—Fairly distinct; varies in colour.

Band N_2—Regular in shape; not distinctly marked; root dots fairly distinct.

Band N_3—Distinct; light blue grey in colour.

Height—7 to 8 feet without tops.

Girth—$3\frac{1}{4}$″ to 4″; regular throughout.

Inter-nodes—5″ to 7″.

Aerial roots—None or few.

Buds—Fair sized; rounded; pointed; covered by fibrous brown scales.

Dr. Leather's *Analysis*—

	Poona Farm Crop.	
	1896. (Fresh Imports.)	1897. (Acclimatized 1 year.)
Percentage of juice to cane	70·10	63·70
Do. of sugar to juice	8·22	14·50
Do. of glucose in juice	2·41	0·80

Variety—Streaked cane.

Streaked cane.

Where grown—Gadag, Dhárwár District; also Belgaum and Khánápur, Belgaum District.

General appearance—A tall, thick, soft cane; irregularly streaked in purple and green or pale purple and yellow colours; streaks not so distinct as in *rámrasdáli*.

Type—C and E combined; but inter-nodes only slightly bulged and cane only slightly zigzag in appearance.

Bloom—Good deal.

Nodes—Ring N_1—Fairely well marked; varying in colour; upper nodes yellow; lower nodes irregular in colour.

Band N_2—Irregular; also varies in colour; root dots very distinct, but small.

Band N_3—Distinct; light blue-grey coloured.

Height—7 to 8 feet without tops.

Girth—4″ to $4\frac{1}{2}$″; thick canes 5″.

Inter-nodes—4″ to 5″; lower inter-nodes slightly smaller in diameter than the middle ones.

Aerial roots—None.

Buds—Fairly large; pointed; prominent; covered with *kháki*-coloured scales.

Dr. Leather's *Analysis*—

	Poona Farm Crop. (Streaked Cane from Gadag.) 1896. (Fresh Imports.)	Poona Farm Crop. (Streaked Cane from Gadag.) 1897. (Acclimatized 1 year.)	Belgaum, Khánápur and Gadag Crop. (Local.) 1896.
Percentage of juice to cane ...	70·20	69·86	71
Do. of sugar to juice ...	8·87	14·50	14·55 to 17·37
Do. of glucose in juice ...	2·12	0·50	0·79 to 1·39

(B)—Varieties outside the Bombay Presidency.

(*Examined by* Dr. Leather.)

Madrási pounda.

Variety—Madrási pounda.

Where grown—Sitápur; Bára Banki; Bareilly.

General appearance—A thick, orange-yellow to green straight cane; this is a very erect strong cane, harder outside than most *poundas*; little liable to crack lengthwise or to fall down; it gives about 70 per cent. of juice, and has about 15 to 16 per cent. of sugar in the juice (*vide* Cawnpore Farm Experiments).

Type—A, frequently C.

Bloom—None.

Nodes—Ring N_1—Generally indistinct or absent.

Band N_2—Drab or green; root dots prominent.

Band N_3—Distinct; gray coloured.

Height—5 to 8 feet.

Girth—4″ to $4\frac{3}{4}$″.

Inter-nodes—$3\frac{1}{2}$″ to 5″.

Aerial roots—Common; they grow from one node to the other like the Sháháranpuri *pounda*.

Dry leaves—Generally open out.

Samsára.

Variety—Samsára.

Where grown—Dumraon; Burdwan.

General appearance—A yellow green cane; frequently lemon yellow, or orange coloured where exposed to sunlight; erect.

Type—C, sometimes A.

Bloom—Very little; no scorings.

Nodes—Ring N_1—Narrow; indistinct.

Band N_2—Orange or yellow-green; root dots distinct.

Band N_3—Well defined; gray.

Height—4 to 6 feet at Dumraon; 8 to 12 feet at Burdwan.

Girth—$3\frac{1}{2}$″ to 4″.

Inter-nodes—3½" to 4½."

Aerial roots—Many; they grow from one node to the next below in a very characteristic manner.

Buds—Large; groove narrow deep.

Dry leaves—Open out from cane.

Dr. Leather's *Analysis*—

	Dumraon Castor-cake Plot.	Farm Crop. Gattle-dung Plot.	Burdwan Castor-cake Plot.	Farm Crop. Cattle dung plot.	Village Kantal-gachi.	Village Banpata.	Village Hartsimal.
Percentage of juice to cane ...	...	...	...	...	71·80	73·20	67·70
Percentage of sugar to juice ...	12·35	15·36	14·24	14·24	15·24	15·24	15·24
Percentage of glucose in juice .	1·34	0·72	1·86	1·86	1·86	1·86	1·86
Specific gravity at 15·5° C. ...	1,067	1,074	1,075	1,075	1,079	1,078	1,078

Sháháranpuri.

Variety—Shâhâranpuri.

Where grown—Cawnpore and Bareilly.

General appearance—Yellow green coloured; straight; generally free from black patches at Cawnpore, but some patches found at Bareilly.

Type—Generally C, less frequently A.

Bloom—A little.

Nodes—Ring N_1—Indistinct; green.

Band N_2—Orange coloured; root dots very distinct.

Band N_3—Blue gray.

Buds—Very liable to shoot.

Height—4 to 6 feet.

Girth—3¼" to 4".

Inter-nodes—2" to 3"; sometimes 5".

Aerial roots—Very frequent throughout the whole length of cane, and grow from one node to the other.

Dry leaves—Open out and expose the cane.

Dr. Leather's *Analysis*—

	Cawnpore Crop.	Bareilly Crop.
Percentage of sugar to juice ...	13·54	14·92
Percentage of glucose in juice ...	0·67	0·37
Specific gravity at 15·5° C. ...	1,066	1,070

Kájli.

Variety—Kájli.

Where grown—Burdwan.

General appearance—A purple cane; straight.

Type—A or D.

Bloom—Good deal.

Nodes—Ring N_1—Indistinct; yellow or purple.

Band N_2—Generally yellow on upper part; purple on lower end; root dots prominent.

Band N_3—Distinct; gray.

Height—6 to 8 feet.

Girth—3″.

Inter-nodes—3″ to 3½″.

Aerial roots—Many; half-way up the cane.

Dr. Leather's *Analysis*—

	Village Hartsimal.	Village Kantalgachi.	Village Banpata.
Percentage of juice to cane ...	66·00	68·10	68·00
Do. of sugar to juice ...	17·05	17·05	17·05
Do. of *gur* to cane ...	13·00	13·0	13·00
Do. of glucose in juice ...	1·54	1·54	1·54
Specific gravity at 15·5° C. ...	1,083	1,080	1,080

Purple pounda.

Variety—Purple pounda.

Where grown—Bára Banki; Bareilly.

General appearance—Sometimes reddish purple, sometimes very dark purple.

Bloom—Only on the Band N_3 below the nodes.

Height—5 to 7 feet.

Girth—3½″ to 4½.″

Inter-nodes—3″ to 4½″.

Aerial roots—Sometimes at lower end.

Dry leaves—Fall off.

Mungo.

Variety—Mungo.

Where grown—Dumraon.

General appearance—Yellow green coloured; straight; seldom scored and with no black patches; very like *bhurli*, but the leaves are of lighter green colour, and are soft and crumpled up.

Type—B.

Bloom—Much.

Nodes—Ring N_1—Indistinct and drab.

Band N_2—Drab; root dots not very distinct.

Band N_3—Indistinct.

Height—5 to 7 feet.

Girth—2″ to 2½″.

Inter-nodes—3¾″ to 4½″.

Aerial roots—None.

Buds—Small.

Dry leaves—Remain folded.

Dr. Leather's *Analysis*—

	Dumraon Farm Crop, 1897.	
	Castor-cake Plot.	Cattle-dung Plot.
Percentage of sugar to juice	11·73	13·53
Do. of glucose in juice	1·18	0·46
Specific gravity at 15·5° C.	1,058	1,064

Bhurli.

Variety—Bhurli.

Where grown—Dumraon.

General appearance—A short yellow green coloured cane; straight and of uniform thickness; black patches infrequent; scoring infrequent; very like *mungo*; the canes of these two varieties are almost indistinguishable, but the green leaves are quite distinct; those of *bhurli* are deeper green and not soft and crumpled up like those of *mungo*.

Type—B.

Bloom—Considerable.

Nodes—Ring N_1—Indistinct; drab.

Band N_2—Drab; green; root dots distinct.

Band N_3—Indistinct; gray.

Height—4 to 6 feet.

Girth—2″ to 2¾″.

Inter-nodes—3½″.

Aerial roots—None.

Dry leaves—Sometimes open out; sometimes remain folded.

Dr. Leather's *Analysis*—

	Dumraon Farm Crop.	
	Castor-cake Plot.	Cattle-dung Plot.
Percentage of sugar to juice	13·76	16·09
Do. of glucose in juice... ...	0·70	0·23
Specific gravity at 15·5° C.	1,067	1,074

Pansábi.

Variety—Pansábi.

Where grown—Behea.

General appearance—A cane taller than the *mungo* and *bhurli* with which it is grown; green and yellow green coloured; erect; black patches frequent.

Type—D.

Bloom—Not much.

Nodes—Ring N_1—Indistinct; narrow; orange.

Band N_2—Drab coloured; root dots indistinct.

Band N_3—Gray.

Height—4 to 6 feet.

Girth—2″ to 2½″.

Inter-nodes—2″ to 4″.

Aerial roots—Common at lower end.

Bud—sSmall and round.

Dry leaves—Open out from cane

Dr. Leather's *Analysis*—

Percentage of juice to cane	...	53·50
Do. of sugar to juice	...	14·56
Do. of glucose in juice	...	0·44
Specific gravity at 15·5° C.	...	1,071

Khári.

Variety—Khári.

Where grown—Dumraon and Burdwan.

General appearance—A tall, thin, hard, yellow green cane, sometimes pinkish coloured where exposed; at Dumraon quite straight; at Burdwan much bent at upper end; frequently many black patches; scorings common.

Type—D.

Bloom—Much.

Nodes—Ring N_1—Very distinct; orange coloured.

Band N_2—Narrow; drab; root dots indistinct.

Band N_3—Not very distinct.

Height—6 to 8 feet.

Girth—$2\frac{1}{4}''$ to $2\frac{3}{4}''$.

Inter-nodes—$3\frac{1}{2}''$ to 5″.

Aerial roots—Some.

Buds—Large; groove very little developed.

Dry leaves—Open out partly.

Dr. Leather's *Analysis*—

		Dumraon Castor-cake Plot.	Farm Crop. Cow-dung Plot.	Burdwan Castor-cake Plot.	Farm Crop. Cow-dung Plot.
Percentage of juice to cane	...	...	...	...	61·80
Do. of sugar to juice	...	10·90	15·43	16·59	18·96
Do. of glucose in juice	...	0·71	0·32	1·03	0·36
Specific gravity at 15·5° C.	...	1,059*	1,073	1,078	1,084

Puri.

Variety—Puri.

Where grown—Burdwan

General appearance—A clean yellow or yellow green cane; straight; no scorings.

Type—B.

Bloom—None.

Nodes—Ring N_1—Fairly distinct; narrow; lemon coloured.

Band N_2—Cream coloured; root dots distinct.

Band N_3—Very distinct; gray.

* Much laid.

Height—4 to 6 feet.

Girth—2½″.

Inter-nodes—2¾″.

Aerial roots—Some.

Buds—Small.

Dr. Leather's *Analysis*—

Percentage of juice to cane	...	...	72·10
Do. of sugar to juice	...	...	18·02
Do. of *gur* to cane	...	...	11·30
Do. of glucose in juice	...	...	0·76
Specific gravity at 15·5° C.	...	...	1,083

Dikchan.

Variety—Dikchan.

Where grown—Cawnpore; Shahjáhánpur.

General appearance—Yellow green coloured; some black patches; inclined to grow crooked.

Type—D.

Bloom—A good deal.

Nodes—Ring N_1—Distinct and very broad; sometimes as broad as the Band N_2.

Band N_2—Yellow or green coloured; root dots very prominent.

Band N_3—Blue gray.

Height—8 to 10 feet.

Girth—2″ to 2¾″.

Inter-nodes—4½″ to 5″.

Aerial roots—Very frequent and extend a long way up the cane; only at lower end at Shahjáhánpur.

Dry leaves—Remain folded.

Dr. Leather's *Analysis*—

Percentage of sugar to juice	...	...	10·99
Do. of glucose in juice	...	...	0·49
Specific gravity at 15·5° C.	...	...	1,060

Dhaul; dhaur.

Variety—Dhaul; dhaur.

Where grown—Cawnpore; Bareilly; Shahjáhánpur.

General appearance—Mainly drab coloured, but tinged with green at the top and bottom ends; scored longitudinally.

Type—B.

Bloom—Good deal.

Nodes—Ring N_1—Distinct; orange coloured or brick red; frequently broader at one side than at the other.

Band N_2—Drab or green coloured; root dots distinct and prominent.

Band N_3—Gray coloured.

Height—6 to 8 feet.

Girth—2″ to 2¼″.

Inter-nodes—5″ to 6″.

Aerial roots—Occasionally at lower end.

Dry leaves—Remain folded tight.

Dr. Leather's *Analysis*—

Percentage of sugar to juice	...	...	13·32
Do. of glucose in juice	...	...	0·57
Specific gravity at 15·5° C.	...	...	1,066

Matna.

Variety—Matna.

Where grown—Cawnpore and Shahjáhánpur.

General appearance—Green and drab coloured; fairly straight, but the tall ones bend at the top; scored longitudinally; black patches infrequent.

Type—B, sometimes C.

Bloom—Good deal.

Nodes—Ring N_1—Orange coloured and moderately distinct.

Band N_2—Drab; root dots very distinct.

Band N_3—Very indistinct.

Height—7 to 8 feet.

Girth—2″ to 2¼″ at Cawnpore; 2″ to 3″ at Shahjáhánpur.

Inter-nodes—4″ at Cawnpore; 2″ to 3″ at Shahjáhánpur.

Aerial roots—None.

Dry leaves—Remain folded.

Dr. Leather's *Analysis*—

Percentage of sugar to juice	...	...	13·3.
Do. of glucose in juice	...	...	0·77
Specific gravity at 15·5° C.	...	...	1,067

Pansábi.

Variety—Pansábi.

Where grown—Gorakhpore.

General appearance—A pale green to yellow cane; straight, inclined to sprout at upper end. This is probably not the same as the *Pansábi* grown at Behea.

Bloom—Some.

Height—6 feet.

Girth—2¾″.

Inter-nodes—4½″ to 5″.

Aerial roots—None.

Dry leaves—Remain folded.

Chuni.

Variety—Chuni.

Where grown—Bareilly, Shahjáhánpur.

General appearance—Mostly yellow, with pale green; very like *ráhra*; but the inter-nodes are longer, and the Band N_3 is much darker.

Type—B.

Bloom—Good deal.

Nodes—Band N_3—Distinct; blue gray.

Height—4 to 6 or 7 feet.

Girth—2″ to 2½″.

Inter-nodes—4″ to 6″.

Aerial roots—Common at lower end.

Sarauti.

Variety—Sarauti.

Where grown—Bára Banki.

General appearance—A white cane; bluish coloured at nodes.

Bloom—A little.

Height—3 to 4 feet.

Girth—1½″ to 2½″.

Inter-nodes—2½″ to 3″.

Aerial roots—Infrequent.

Kaswár.

Variety—Kaswár.

Where grown—Bára Banki.

General appearance—A bluish white coloured cane; straight.

Bloom—Some.

Height—3 to 5 feet.

Girth—1¾″ to 2¼″.

Inter-nodes—2½″ to 3″.

Aerial roots—None.

Dry leaves—Remain folded tight.

Kitáva.

Variety—Kitáva.

Where grown—Shajáhánpur and Bára Banki.

General appearance—A pale yellow to green cane.

Bloom—Fair amount, especially at nodes.

Nodes—Almost colourless and smooth.

Height—4 feet.

Girth—2″ to 2¾″.

Inter-nodes—3″ to 4″.

Aerial roots—A little at lower end.

An experiment made by Mr. Ricketts, Special Manager of Court of Wards' Estates, Bára Banki, on 728 square feet gave the following results. It is equal to an outturn of 2,154 lbs. *gur* per acre. The land was unirrigated alluvium :—

	Lbs.
Cane	500
Juice	310
Gur	36
Percentage of juice to cane	62·0
Do. of *gur* to cane	7·2

Rehra.

Variety—Rehra.

Where grown—Gorakhpore.

General appearance—A pale yellow cane; inclined to sprout at the top end.

Bloom—Some.

Nodes—Smooth.

Height—5 feet.

Girth—$2\frac{3}{4}$″.

Inter-nodes—2″ to $3\frac{1}{2}$″.

Aerial roots—None.

Dry leaves—Open out more or less.

Rámwie.

Variety—Rámwie.

Where grown—Sitápur, Bára Banki.

General appearance—A yellow cane with pink patches; smooth and straight; does not sprout.

Bloom—Much.

Nodes—Smooth with orange ring above them.

Height—4 to 6 feet.

Girth—$1\frac{1}{2}$″ to 2″.

Inter-nodes—3″ to 6″.

Aerial roots—Common at lower end.

Dry leaves—Remain folded.

The following figures were obtained in experiments made by Messrs. Martin and Ricketts, Special Managers, Court of Wards' Estates, Sitápur and Bára Banki. Mr Martin's test was taken on $\frac{1}{32}$ acre, and shows an outturn of 1,824 lbs. *gur* per acre; Mr. Ricketts' was on 1,029 square feet, and is equal to 2,370 lbs. *gur* per acre :—

	Mr. Martin's test. (Sitápur.)	Mr. Ricketts' Test. (Bára Banki.)
	Lbs.	Lbs.
Cane	798	500
Juice	420	289
Gur	57	56
Percentage of juice to cane	52·6	57·8
Do. of *gur* to cane	7·1	1·2

Variety—Parrárah.

Parrárah.

Where grown—Sitápur.

General appearance—A straw yellow to pale green coloured cane; fairly straight.

Bloom—Good deal of pale blue.

Nodes—Dark green above node.

Buds—Inclined to sprout.

Height—5 to 6 feet.

Girth—$2\frac{1}{2}''$ to $2\frac{3}{4}''$.

Inter-nodes—3″ to $4\frac{1}{2}''$.

Aerial roots—None.

Dry leaves—Remain folded tight.

A test made by Mr. Martin, Special Manager of Court of Wards' Estates, gave the following outturn on $\frac{1}{32}$ acre, which is equal to 2,848 lbs. *gur* per acre :—

	Lbs.
Cane	1,063
Juice	577
Gur	89
Percentage of juice to cane	54·2
Do. of *gur* to cane	8·3

Variety—Kárwie.

Kárwie.

Where grown—Bára Banki.

General appearance—A pale yellow cane; thinner at lower end than at upper end. This cane appears to be similar to *chuni.*

Bloom—A good deal.

Nodes—Smooth; Ring N_1 distinct and orange yellow coloured.

Height—3 to 5 feet.

Girth—$1\frac{3}{4}''$ to 2″.

Inter-nodes—3″ to 5″.

Aerial roots—Some at lower end.

Dry leaves—Remain folded tight.

Variety—Thun.

Thun.

Where grown—Shahjáhánpur.

General appearance—A yellow green cane, much inclined to sprout along its whole length; straight.

Bloom—None.

Height—4 to 5 feet.

Girth—$3\frac{3}{4}''$ to 4″.

Inter-nodes—$2\frac{1}{2}''$ to $3\frac{1}{2}''$.

Munga.

Variety—Munga.

Where grown—Bára Banki.

General appearance—A yellow and bright green coloured cane; straight.

Bloom—Hardly any.

Height—6 to 7 feet.

Girth—1½″ to 2″.

Inter-nodes—4″ to 6″.

Munga.

Variety—Munga.

Where grown—Shahjáhánpur.

General appearance—A bright green coloured cane; inclined to grow crooked. It is doubtful whether this is the same variety as that called *munga* at Bára Banki.

Type—D.

Bloom—Hardly any.

Height—6 feet.

Girth—2″ to 2¼″.

Inter-nodes—2¼″ to 4″.

Aerial roots—Common for three-fourths of the whole length.

Rákra.

Variety—Rákra.

Where grown—Shahjáhánpur.

General appearance—Colour almost white.

Type—B.

Bloom—A little.

Nodes—Ring N_1 distinct; yellow.

Height—7 feet.

Girth—2″ to 2¼″.

Inter-nodes—2½″ to 3½″.

Aerial roots—None.

Dry leaves—Remain folded tight.

GINGER—*Zingiber officinale*—Roscoe.

Natural Order—*Scitâmineæ.*

Maráthi, *Ále* ; Gujaráti, *Ádu* ; Kánarese, *Alla.*

Habitat.

Watt says, "Ginger is not known in a wild state, but it is, doubtless, a native of tropical Asia, in which it has been cultivated and exported from very remote times. It is now grown in all hot climates. In India it is grown in all the warmer parts, but chiefly in the plains."

General character of the plant.

This plant belongs to a family of aromatic herbs with creeping root stocks or rhizomes. Turmeric and cardamom belong to the same family. The ginger plant is a perennial. The stems are about 18″ to 24″ high in a good crop, and do not branch. The leaves are linear lanceolate. The plant rarely produces flowers in the Bombay Presidency.

Distribution in the Bombay Presidency.

The crop occupies from 1,000 to 1,500 acres annually in the Presidency Proper. It is a very important crop in Baroda Territory. Ahmedabad grows 300 to 400 acres, Kaira 300, Surat 200, Sátára 120, Thána 200. In other districts of the Presidency the cultivation is very trifling.

Soil.

Ginger likes a deep, rich, free working soil, which is naturally well drained. It grows to great perfection on the deep, alluvial, sandy loams (*gorâdu*) of Kaira and Baroda. The garden land of Surat in which the crop is important is somewhat heavier, but of the same general character and consistence. In the Thána District, where the rainfall is heavy, the crop is only grown in the strip of deep, sandy soil which fringes the coast in the Máhim and Bassein Tálukas.

Rotation.

In Thána, ginger is rotated with betel vines, plantains and sugarcane. In Northern Gujarát it is rotated with a number of other garden crops, such as sugarcane, *surans*, turmeric, onions, garlic, chillies, brinjals, cabbages, *methi*, etc. Most of these crops are found in different patches in the same garden in a single year.

Mixtures.

Ginger in Thána is grown alone. In Northern Gujarát, a thick sprinkling of *guvár* is shown with the crop. Yams are planted at the corners of the beds and along the *bándhs* which separate the beds, or, instead of yams, turmeric may be so grown.

Cultivation in the Kaira District.

Early in May, about forty loads of old farmyard manure should be given per acre. Tank mud is sometimes used instead of part of the above dressing. The tank mud requires some time to weather into a pulverized condition, and is therefore carted on to the land in April or earlier. The land is watered to admit of ploughing, and when properly dry, ploughing begins. The land is ploughed as often as is necessary to loosen the soil to a considerable depth and secure a fine state of tilth. Four to six ploughings with the light *hal* are needed. If left untouched

for a fortnight after ploughing, the surface becomes quite friable, and *kyáras*, or beds should at once be formed. These are laid out with exactness. The compartments are usually 8 cubits by 4 cubits (about 12 feet by 6 feet), and a water channel runs between each double line of these. Thus the water channels are 8 cubits distant from each other. If the ground is uneven, the beds may be of smaller size; but wherever the ground is tolerably level, the size mentioned is common.

The sets and planting.

The ginger sets which consist of pieces of the rhizome bearing two or three buds are now planted with the greatest regularity in rows at a depth of 2 inches below the surface and a span (9 inches) apart in each direction. With a narrow *pávdo*, the cultivator dexterously forms a number of equi-distant little pits in the *kyára*. The sets are pressed down into these pits, covered with soil, and the whole surface smoothed with the hand. In a *kyára* (8 cubits by 4 cubits) 144 sets are planted. Allowing for water channels, about 550 beds go to the acre. Consequently, an acre requires about 77,000 sets. 1,200 to 1,500 lbs. are sufficient to plant an acre, but the weight of sets varies somewhat with the size of the rhizomes from which they are cut. The seed rate is, therefore, sometimes about 2,000 lbs. per acre. A given weight of sets cut from well-developed rhizomes will not go so far in planting as the same weight cut from rhizomes which are not so well developed. Well-developed rhizomes, however, produce the best sets. There is a general belief among cultivators of Baroda and of the Kaira District of Gujarát that ginger for planting purposes should have been grown in a soil that had not been previously irrigated for some years. They bring ginger for sets from the Ahmedabad Collectorate, because they think and say that their own would rot in the ground. Planting takes place in May or early in June before the monsoon breaks, and immediately the sets are in the ground, water is applied. Along with ginger seeds of *guvár* are often sown a decided sprinkling over the whole ground. The variety commonly grown is *sotia*. It grows in rich garden land about 8 feet high, and yields pods which are esteemed as a vegetable. The *guvár* shades the young ginger. The side leaves are stripped off as the pods are plucked, and thrown down in the ginger as a green manure. The *guvár* should be uprooted and removed as soon as the green pods are all plucked. The leaves, if not used as green manure, are used as cattle-food, and the stalks, when dry, as fuel.

Guvár subordinate to ginger.

In Gujarát, generally, castor cake is always given in repeated top dressings after the crop has made some progress. Rich, well-to-do cultivators give as much as 3,000 lbs. per acre in addition to the farmyard manure applied before plantation. In the Máhim gardens an application of castor cake alone is used, and 3 tons (sometimes more) per acre are given in three top dressings—the first in July, the second in August, the third in September, the last being the heaviest. The castor cake should be crushed to a fine powder before application, and stirred into the soil with the *khurpa* (weeding hook).

Top dressing with manure.

Weeding is thoroughly done by hand tool (*khurpa*); the crop may have to be gone over from 3 to 6 times according to the condition of the field. Two of the most

Weeding.

troublesome weeds are *chido* and *luni*. The former (*Scirpus maritimus*) is a grass-like sedge, with fibrous roots and vertical root stocks which descend 8 to 12 inches below the surface, and there connect with an extensive system of rhizomes, which it is next to impossible to eradicate. The latter (*Portulaca quadrifida*) is a small dicotyledon, with a creeping aërial stem rooting at the joints and bearing fleshy leaves. It overruns the surface with great rapidity, and would quickly do great damage if not removed.

Irrigation.

Ginger, on the lighter descriptions of soil, must be watered every six days until the rains. If thereafter there is a break in the rainfall of more than ten days' duration, irrigation must be resumed. When the rains cease, irrigation is required every sixth day until the crop is ripe. The crop is ready for harvest by November or December, but no certain rule can be given. A liberal application of manure—particularly a top dressing of castor cake—would hasten maturity by a month or more.

Harvesting.

Ginger is dug by hand with a small native hand pick, and is sold to a dealer who either sells it as ginger or converts it into *sunth*, in which form it is used for condiments and medicines.

Outturn and value.

Under favourable conditions, an acre may yield 12,000 lbs. of dry cleaned rhizomes. The sun dried partially cleaned rhizomes are sold by the cultivators to dealers at 40 to 50 lbs. per rupee in ordinary seasons. Selected pieces of rhizomes after storage for several months are worth as sets for re-planting about 25 lbs. per rupee. A crop test which was taken in the Surat District in good garden land in 1895-96 gave for a mixed crop of ginger and turmeric the following outturn results :—

	Per acre. Lbs.
Ginger	8,337
Turmeric	2,564

The storage of ginger in its fresh state.

The central room of any ordinary well built house is usually cool and, therefore, more suitable than a warmer apartment for the storage of ginger. A cool moist atmosphere and ventilation are required. The ginger should be sorted before it is stored, and any decayed portions removed. The apartment is prepared by digging up the earthen floor 10″ to 12″ deep and by soaking the upturned earth with water. The water is absorbed in eight or ten days, and the floor then becomes dry enough. The sun dried sorted ginger is then built up in a heap to a height of 4 to 5 feet. If the room is large, and the ginger not sufficient to fill it, the heap is built to the required height on a portion of the floor. The heap when finished is covered with dry dead turmeric or ginger leaves which are sprinkled with water. The heaps are examined periodically once a fortnight or oftener. If the ginger in the centre of the heap is found hot or warm, the whole is removed from the room, and any decaying or rotten pieces separated. In three or four days the ginger is again heaped up. If the heap remains cool during storage, the owner knows that the ginger is taking no harm. In April and May the doors of the room should be kept open, as the outside temperature is

then very high, and the storage room should be ventilated as much as possible. During the very hot weather the stored ginger should be often carefully examined, as it is apt to go wrong at this time, and the prompt removal of decaying portions is absolutely necessary. Ginger can be stored as described for seven or eight months. Ginger during storage loses weight by dryage, and also a certain proportion gets rotten. This loss will vary from 15 to 20 per cent. in well stored ginger and from 20 to 40 per cent. in ginger less carefully stored. The dealer, however, who stores green ginger waters it before he offers it for sale. The water is absorbed, and the ginger is increased in weight.

The preparation of *sunth* (dry ginger) from green ginger in the Surat District.

The best *sunth* is prepared from well developed, properly matured rhizomes. The best shoots of each rhizome are equally well suited for *sunth* or as sets for planting. The residue left when the best shoots are removed is called *sakat*. This will yield 14 to 16 per cent. of inferior *sunth*, while the well developed selected shoots will yield 18 to 23 per cent. *sunth*.

The ginger when it is dug is sun dried, and then adhering earth is removed as far as possible. The first operation in *sunth* making is to soak the partially cleaned rhizomes in water. This with rubbing cleans the rhizomes, and also softens them. The soaking facilitates the removal of the outer skin. It is scraped off with a shell or broken piece of earthenware. The scraped ginger is now washed and exposed for three or four days to the sun on an ordinary threshing floor. The ginger is thus bleached and dried. It is now rubbed by hand. The object is not clear. The operation is done carefully, so that the shoots are not broken. The ginger is again bleached in the sun for three or four days, and again hand rubbed. It is now steeped in water for two hours, and exposed on a clean floor to the sun until it gets dry. When dry, it is rubbed on a coarse cloth or coarse sacking. This removes any outer skin not previously removed by scraping. The *sunth* is now ready for market. The cost of *sunth* making is about Rs. 3 per *khandi* of 20 maunds of green ginger. A Surat maund is 40 *sers* of 38 *tolas* (39 *tolas* per lb.).

Cost of Cultivation, Surat District.

	Per acre. Rs. a. p.
Manure 30 loads and spreading	16 0 0
Preparatory tillage—6 ploughings with light *hal*, 2 harrowings, once levelled with plank roller	6 8 0
Making beds and water channels and levelling beds ...	3 8 0
Digging pits and planting ginger	4 0 0
Cost of ginger sets 1,500 lbs. per acre. (This quantity after storage is equal to about 2,000 lbs. of selected sets sufficiently dry for storage)	70 0 0
Top dressing with castor cake 2,000 lbs. per acre ...	25 0 0
Hand weeding four times and earthing up ginger plants in September	7 0 0
Irrigation—watering three times before rains, four times during rains and eight times after rains	40 0 0
Digging and cleaning ginger (good crop)	17 0 0
	Rs. 183 0 0

TURMERIC—*Curcuma longa*—Roxb.

Natural Order—*Scitamineæ.*

Maráthi, *Halad*; Gujaráti, *Haldar*; Kánarese, *Arshana.*

General character of the plant.

This is a perennial herbaceous plant which is cultivated for the sake of its rhizomes. The leaves have long leaf stalks, with long moderately narrow blades, widest near base and thence tapering to a point. The flowers are "yellow, arranged in spikes, each in the axil of a greenish or purplish red bract. The summit of the spike is composed of the empty bracts which are white, tinged with pink." (Duthie and Fuller.)

Habitat.

Simmonds says that Curcuma longa grows wild in Mysore. Some varieties of Curcuma are undoubtedly found wild in India. Some writers appear to have mistaken these for a wild form of Curcuma longa. Dr. Watt thinks it is a Chinese or Cochin Chinese species.

Varieties.

There are two distinct varieties—

(*a*) with hard, rich coloured rhizomes, from which a yellow dye is obtained;

(*b*) with softer, larger, lighter coloured rhizomes which are edible.

Distribution.

Turmeric is extensively cultivated all over India. In 1898-99 the Bombay area was 5,300 acres. Sátára is much the most important centre of cultivation, and claims four-fifths of the whole. Sholápur and Belgaum grow fair areas. Throughout Gujarát the crop is important as a subordinate crop with ginger, and the area returns for Gujarát are therefore estimates.

Soils.

Turmeric does best in medium black soil naturally well drained. Such land in the Deccan with canal or well irrigation is capable of growing all kinds of garden crops. Lighter descriptions of garden soils are better suited for ginger than for turmeric.

Mixtures.

Yams are generally grown subordinate to turmeric, the turmeric being planted in the beds, the yams from 2½ to 3 feet apart along the borders of the beds, with chillies at the corners. Sometimes ginger is planted in the beds, and the turmeric occupies the borders only.

Rotations.

On mixed black soil in the Deccan, turmeric is rotated with sugarcane, chillies, groundnuts, onions, irrigated wheat, gram, etc., and the land is occasionally rested from irrigation; then dry crops of *jowár*, *bájri*, etc., are grown. In Gujarát on garden land the crop is rotated with sugarcance, ginger, onions, garlic, *surans* and the other ordinary garden crops.

Ginger and subordinate turmeric.

Ginger and turmeric are usually cultivated together on deep, free working, loamy soils. The two crops are closely related from a botanist's or agriculturist's points of view, and are well suited for mixed cultivation.

The long straight turmeric leaves stand above the level of the ginger, and thus get abundance of light and air. Moreover, they give to the ginger beneficial shade. Turmeric as a mixed crop with ginger gets the same treatment as the latter. The cultivation (*i.e.*, the preparatory tillage, planting, weeding, top dressing, and watering) is identical with that already described for ginger. The sets of turmeric are selected pieces of rhizomes, with two or three eye buds. 600 to 800 lbs. of good sets per acre are required to plant the borders of ginger beds. The turmeric sets are planted 12 to 15 inches apart. Turmeric is ripe when the leaves die down. It is dug up about December-January with a small hand pick, generally after the ginger is removed.

Cultivation of Turmeric and Yams in Gujarát.

The land is prepared and laid out into beds 12′ × 6′ as for ginger. 1,800 lbs. to 2,000 lbs. per acre of turmeric and 600 lbs. to 700 lbs. per acre of yams are required to plant an acre. A yam of full average size gives six to eight sets for planting. The turmeric sets are planted in equi-distant pits dug from 12″ to 15″ apart in the beds. The pits should be about 3″ deep. Each set is placed in a pit and carefully covered with loose soil pressed down over it. The yam sets are each planted in pits dug 4″ deep along the borders and 2½ to 3 feet apart. Very often seeds of chillies are sown at the corners of the beds, and three or four seedlings left in each clump to grow. The crop needs careful hand weeding from time to time, and irrigation, when needed, every eighth day. If the crop is planted in May, it is dug up in December-January or February, Neither the turmeric nor the yams are damaged by being left in the field after maturity. They are dug up usually as the owner finds a good market—the turmeric by means of a small pick, the yams by means of a pick with an iron piece some 15″ long. The yams are deeply buried in the soil, and it is an expensive process digging them out without breaking or damaging the tubers.

Harvesting.

Two crop tests taken in 1895-96 in good garden land in the Surat District gave the following outturn results; each crop was considered full average:—

Outturn results.

	First Test. Per acre.	Second Test. Per acre.
	Lbs.	Lbs.
Turmeric	13,570	14,842
Yams	6,022	9,014

The above weights represented the weights of the mixed crop as dug by actual test. It was found that the ratio of cleaned green turmeric with old sets removed to uncleaned turmeric as dug was as 11 to 16.

Cleaned green turmeric as sold by the cultivator to the dealer is worth in ordinary seasons 60 to 70 lbs. per rupee. The loss by dryage subsequently is very considerable. Turmeric sets are worth about Rs. 25 per *khandi* of approximately 780 lbs.

Value.

The turmeric crop in the Bombay Presidency is practically exempt from any kind of disease. During excessive rain on medium black soil the sets rot.

Diseases.

The variety commonly grown for dye is called *lokhandi halad,* and has very hard rhizomes. Turmeric yields a fleeting dye of a dull yellow colour. The rhizomes after being boiled are mashed to a pulp, and a decoction is made from the paste. In this cloth may be dyed; but, as already noticed, the dye is not fast. The action of an alkali change the colour to red.

The dye.

Cost of cultivating Turmeric and Yams, Surat District.

	Per acre. Rs.	a.	p.
Manure—40 cart-loads ordinary manure and spreading ...	21	0	0
Preparatory tillage—6 ploughings with light *hal*—2 harrowings and levelling with plank-roller	6	8	0
Making beds and water channels and levelling beds	3	8	0
Digging pits and planting turmeric and yams	4	0	0
Cost of turmeric sets 1,800 lbs.	55	0	0
Cost of yam sets 600 lbs.	12	0	0
Hand weeding four times	4	8	0
Irrigation—watering three times before rains, four times during rains and eight times after rains	40	0	0
Digging and cleaning turmeric	9	0	0
Digging and cleaning yams	4	0	0
Rs. ...	159	8	0

THE ELEPHANT'S FOOT—*Amorphophallus companulatus*—Blume.

Natural Order—*Aroideæ.*

Gujaráti, *Suran*; Maráthi, *Suran*; Kánarese, *Suran.*

This is a perennial stemless herb which is cultivated for the sake of its corm. The round, tapering, variegated leaf stalks rise singly or in pairs from each corm and carry the leaf horizontally at the top. "The leaf blade is large, twice bifid, the divisions outwardly pinnatifid, ultimate segments oblong acute." (Duthie and Fuller.) The corm when fully grown is a foot more or less in diameter. Its shape somewhat resembles an elephant's foot, hence the name. There is one central eye-bud, and in a large corm several lateral tuberous excrescences, each of which, if cut off and planted, will grow in the first season into a very small *suran.*

General character of the plant.

Dr. Watt says the *suran* is a native of India and Ceylon, and is cultivated throughout the Peninsula in rich moist soils.

Habitat.

The area under this crop is not separately returned. The crop is important, chiefly in Gujarát and Baroda Territory.

Distribution in the Presidency.

The best crops in the Bombay Presidency are grown on the deep, alluvial, sandy (*gorádu*) soils of the Charotar villages of Kaira and Baroda, and in somewhat similar soil in the garden lands of the Surat District. In the Deccan the *suran* thrives excellently on mixed black soil, such as suits other irrigated crops.

Soils.

Mixtures.

The crop is usually grown alone, excepting that *san (Crotalaria juncea)* is thickly broadcasted between the *surans* and allowed to grow to a height of 2½ to 3 feet. The *san* is then uprooted, broken up by hand, and laid down on the surface as a green manure.

Cultivation.

The *suran* is a gross feeding plant which requires plenty of manure and heavy irrigation. The plant is propagated, in the first instance, from the tuberous excrescences which are cut from fully developed corms. A big corm will yield five to eight tuberose buds for planting. These buds weigh from 1 to 4 ounces each, the average size weighing about 2 oz. Buds of average size should be planted at the rate of sixty to eighty in a bed 12 feet × 6 feet. For the first year's crop less manure is required than for the crop grown from bigger corms in subsequent years. But the preparatory tillage must be thorough, and at least thirty cart-loads of farmyard manure per acre applied. The preparatory tillage should be complete early in May. Beds 12′ × 6′ are now formed, and the buds planted in shallow equi-distant pits. On the surface of the bed over each bud a layer of mango, etc., leaves should be put as a protection against the scorching heat of the sun. Water is given at once, and the field will require three or four waterings before the rains. Irrigation is required during breaks in the rains and regularly once a week after they cease. The crop is carefully hand weeded as required during growth. The leaves die down in November-December, and the first year's produce is then dug. It consists of small, properly shaped corms which weigh about 4 oz. to 6 oz. each. These when dug out and dried in the sun are heaped up under shade, and kept for re-planting *on a different area* in the following May.

Cultivation, second year.

Forty small corms are planted in a bed 12′ × 6′. The cultivation is precisely the same as in the first year. In January the second year's crop is dug out. The corms weigh 1 to 1½ lbs. They are heaped up in the shade, and re-planted again in a different area in May—fifteen in a bed. The tillage being

Cultivation, third year.

the same as already described, forty loads per acre of manure should be given, and at the time of planting *san* should be broadcasted thickly in the beds as a green manure. The *san* grows quickly, and gives beneficial shade to the *suran* leaves. The produce dug out in January consists of *surans* which weigh from 3 to 5 lb. each. The larger sizes are sold, the smaller re-planted in May again

Cultivation, fourth year.

on a different area. A heavy dressing of manure of at least forty cart-loads per acre is given, and again *san* is grown as a green manure. The *san* smothers weeds, and the same extent of hand weeding is not required as in the first two years. Either six or eight *surans* are planted in a bed in the fourth year. This year's crop has an extremely handsome appearance. When in full vigour of growth, the leaves stand quite 4 feet high, and completely shade the ground.

A subordinate crop grown in the fourth year.

It is customary to sow in this crop seeds of *dudhi (Lagenaria vulgaris)*, bottle-gourd, two at the end of each bed. The plants grow vigorously, and should be layered down here and there, so that, when the *surans* die down, the *dudhi* stems completely shade the ground. A good crop yields 8,000 to 10,000 lbs. of bottle-gourds per acre. The *dudhi*, if

planted in October, becomes exhausted by February. Irrigation should then cease, and the *surans* dug out when the soil sufficiently dries. The *surans* of the fourth year weigh from 10 to 20 lbs. each, some particularly well developed corms being heavier. In an acre (allowing for water channels) there are, say, 560 beds; 3,360 *surans* will be obtained per acre. At a very moderate estimate these will weigh 15 tons.

Outturn and value of fourth year's crop.

The gross value of produce at an average market rate of Rs. 25 per *khandi* of 780 lbs. comes to Rs. 1,077 per acre.

The cultivation of these crops can only be undertaken by well-to-do cultivators, a large amount of capital being sunk particularly in the fourth year on account of the value of the sets planted. *Surans* have been known to weigh 40 lbs. or more, but that weight is quite unusual. The corm keeps good for a considerable period, if stored quite dry in heaps in a well ventilated room.

An expensive crop to grow.

Cost of cultivating Surans in the Fourth Year, Surat District.

	Per acre. Rs.	a.	p.
40 cart-loads ordinary manure and spreading	21	0	0
Preparatory tillage—6 ploughings with light *hal*, 2 harrowings and levelling	6	8	0
Making beds and water channels	3	8	0
Making pits and planting *surans*	5	0	0
Sowing *san* and cost of seed 60 lbs. per acre	2	0	0
Cost of *surans* 12,000 lbs. per acre at Rs. 25 per *khandi* (780 lbs.)	385	0	0
Uprooting and breaking up *san* as green manure crop and twice hand weeding	6	0	0
Irrigation—three times before rains, four times during rains and ten times after rains	45	0	0
Digging and cleaning *surans*	10	0	0
Rs.	484	0	0

THE KACHU—*Colocasia antiquorum*—Schott. Syn., *Arum colocasia.*

Natural Order—*Aroideæ.*

Gujaráti, *Alu*; *Pántra*, or *Pándada*, for leaf; *Alvi*, for corms; Maráthi, *Alu*; Kánarese, *Shyámi.*

The long stalked, purplish, green, distinctly veined, large leaves spring from a corm. Leaves are "peltate, cordate, ovate; flowering stems shorter than the leaf stalks, spathe exceeding the spadix, cylindric erect." (Duthie and Fuller.) Established plants send out off-sets which root down and produce perfect plants. The leaves, stalks and corms have somewhat acrid properties before they are cooked. Several varieties are cultivated.

General character of the plant.

The wild form of this arum is a weed in marshy places, and the cultivated plant grows best in damp situations. Patches are grown in the backyards of houses. *Alu* grows well under heavy sewage irrigation. In the garden lands of Gujarát it is common to find a patch of *alu* near a well with single plants

Cultivation, soils, etc.

at the corners of beds of other irrigated crops and here and there through a garden. The crop is rarely grown over a large area. When grown alone, the land is carefully prepared as for other garden crops, and laid out into beds 12′ × 6′ for irrigation. Forty plants occupy each bed. The crop should be freely manured and watered, also weeded as required. Off-sets should be removed before they root, unless it is desired that the whole surface should be covered with plants. This is, perhaps, advisable when the crop is grown under sewage irrigation for the value of its leaves and leaf stalks. If grown for its corm, the plants should be 12″ apart. It takes ten months for the corm to reach maturity. When the crop is planted four or five months, the leaves and stalks may be gathered every three or four days. They should be cut off close to the ground whilst young and tender. A few older leaves should always be left to preserve healthy, vigorous growth.

Harvest.

The corms contain much starch, and afford an important article of native diet to the rich as well as poor. Before being cooked, they are scraped, or partially peeled, and then cut up into small pieces. Boiling extracts the acrid principle which the corms contain. The first water used is thrown away. When sufficiently boiled, the soft pieces are fried in oil, and then subjected to a gentle heat in a close vessel. The usual native flavouring material and condiments are added, tamarind being specially necessary to counteract the acridity left. The stalks are sometimes cooked separately from the leaves. The thin fibrous cuticle is removed by hand and the stalk cut into short pieces. These when cooked are flavoured with condiments and *gul*. To this preparation is added boiling oil (*phodni*), in which mustard, assafœtida, cumin and turmeric are previously mixed. The prepared dish is a sweet curry. The leaves, as well as the stalks, are made into a preparation as under:—The stalks and leaves chopped fine are boiled with a pulse. When cooked, the usual flavouring material is added. Sufficient *dál* flour is added to give consistence, and a gentle heat applied. When sufficiently cooked, boiling oil (*phodni*) with the usual admixture of mustard, etc., is added. These are only one or two ways of the many in which the vegetable is utilized in native households.

Economic uses.

SWEET POTATO—*Ipomæa batatas.*

Natural Order—*Convolvulaceæ.*

Maráthi, *Ráttále*; Gujaráti, *Sakaria*; Kánarese, *Genasu.*

Sweet potatoes are believed to be indigenous to tropical South America, and were introduced into India in comparatively recent times.

Habitat.

Two varieties are in general cultivation throughout the Presidency. The variety most commonly cultivated has cordate, rather sharp-pointed, leaves, with long, vigorous growing vines or trailing stems. The leaves in a thriving crop have a peculiar bronze, shining apperance, and some leaves are irregularly lobed or indented. The flowers are pale purple. The tubers vary in size according to the vigour of the crop. They are always fairly long and spindle shaped. A luxuriant, well manured crop produces

General character of the two Bombay varieties.

large, long red or purple red tubers, often 2″ in diameter at the middle and 8″ or 9″ in length, whilst those from an ordinary crop are rarely more than 1″ in diameter and 5″ or 6″ long. The red or purple variety is believed to be sweeter and less stringy or fibrous than the white variety.

The second variety with white tubers does not usually produce such a vigorous growth of vine and leaf as the red. It is grown in Ahmedabad, in parts of the Deccan, and is in general cultivation in parts of the Southern Marátha Country. The leaves are deeply indented like *math (Phaseolus aconitifolius)*. The flowers are white, and the tubers larger and coarser than the red and more uniform in shape.

Sweet potatoes are not very extensively grown in the Presidency.

Area in the Presidency.

The area is about 12,000 acres annually.

Soils suitable and general condition of cultivation.

The crop occupies an important position, however, amongst garden crops, being suitable for considerable variety of soils. It will grow on the lightest description of sandy soil. It thrives on such soils if a liberal application of manure be given. It also does well on loams or even on soils still stiffer in character. It does best in such fields as are thoroughly well prepared by deep tillage, the soil being loosened and made friable to a considerable depth. The crop does not thrive except on naturally dry land, a water-logged condition of soil causing serious damages. It may be grown, however, on land in weedy condition with fair success, and then exercises an ameliorating influence, because the mass of trailing stems and leaves choke out surface weeds, and tend to suppress such as are more or less established. Moreover, in harvesting the crop, the soil has to be thoroughly dug to a depth of a foot or fifteen inches, and deep rooted weeds are thus destroyed. Sweet potatoes are very commonly grown in dry, river bed land, when the stream is small in the fair season.

Season of growth.

The crop is generally grown during the cold season and under irrigation, but in light dry land a rain crop is sometimes grown. It may be grown after such rain crops as quickly ripen, but usually is the sole crop of the year.

Cultivation of the rabi crop.

The land should be well worked during the monsoon by repeated ploughings and harrowings. In September a liberal dressing of well decayed farmyard manure should be ploughed in. Thirty cart-loads per acre of manure is sufficient. Planting is usually done in October-November. The field before plantation should be laid out for irrigation by forming beds of convenient size. These are ordinarily 12 feet by 6 feet in Gujarát or 10 feet by 10 feet in the Deccan. The crop is propagated by cuttings, sometimes planted in flat beds, sometimes on ridges. The latter is the preferable plan. The cuttings are got from a nursery. In this nursery, cuttings from the vines or stems of the previous year's crop should be planted. Each cutting should consist of a fairly mature portion of a stem, with three nodes or leaf buds. Two of the nodes are placed under ground 2″ or 3″ deep, the other node with a portion of the cutting being free. These cuttings form roots from the underground nodes, and during the monsoon produce vigorous growth of long, trailing stems from the bud or buds above ground, and from these stems the cuttings for the future crop are obtained.

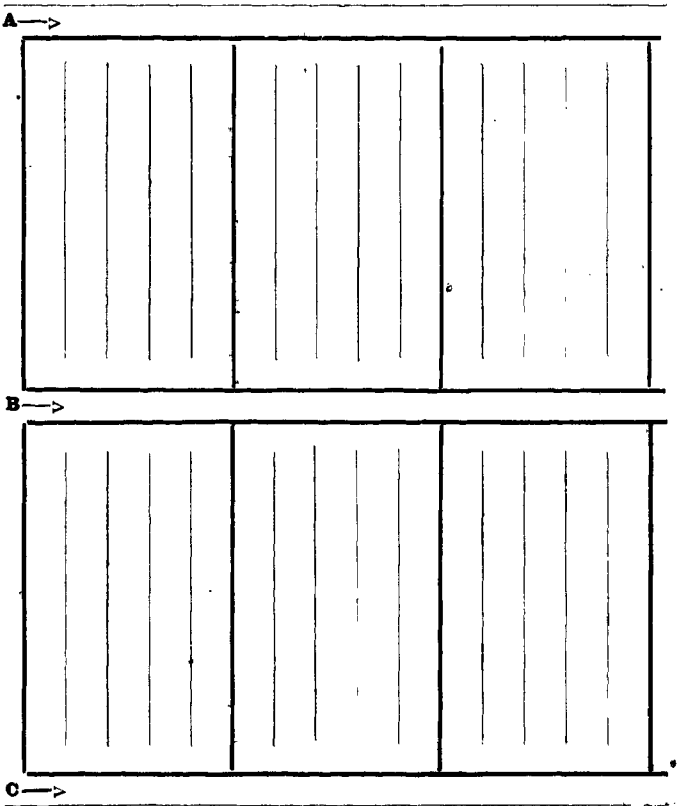
The nursery.

Cuttings.

The best cuttings are got from the middle portions of the stems: The root ends are rejected, also the tender succulent growing parts, the latter not being sufficiently matured for the purpose. All rootlets should be removed from the nodes before plantation.

Two methods of planting.

The cuttings if planted in flat beds are put in shallow pits dug in straight rows. The rows are 18″ apart and the space between two cuttings about 11″ to 12″. If the ridge method of planting is adopted, a small native plough is used to form straight ridges 18″ apart drawn across the field. Cross furrows are drawn 13 feet apart. These form water channels for irrigation, and are represented by **A**, **B** and **C** in the sketch. Beds or water compartments



are made by hand spade by earthing up every fifth ridge and also the edges of the cross water channels; the soil required being got from the ends of the ridges inside each bed. Each water compartment thus contains four

short ridges and five furrows. Cuttings are planted 1 foot apart on each side of each ridge half way between the crest of the ridge and the bottom of the furrow, also the same distance apart, and in the same position round the inside of the *bándhs* which form the watering compartments. About 100 to 120 cuttings are sufficient for a bed 12 feet × 6 feet. Some will probably fail. These should be early replaced. If the ridge system of cultivation is adopted, the cuttings are kept sufficiently moist for satisfactory germination, but are not actually submerged in water. If planted in flat beds, they are submerged, and this is objectionable. The cuttings usually produce roots freely, and the young shoots above ground grow very rapidly.

Weeding. Weeding should be attended to until the crop shades the ground. Afterwards no attention in this respect is required. The crop should be watered every eight or twelve days according to the character of the soil.

Irrigation. The stems come in contact with the wet soil after each watering and become attached to the soil by rooting at the nodes. This must be prevented, otherwise small thin tubers of no marketable value form at each point of attachment, and the tubers which form at the main root do not grow so large as when the stems are kept quite free.

Turning the stems necessary to prevent rooting at various nodes. The stems during growth must be repeatedly lifted clear from the ground, and turned over to prevent the formation of these roots; and if the crop is good and the foliage luxuriant, these operations must be done oftener than in the case of a poor crop, but must be done with care, so that the stems and leaves are damaged as little as possible.

Pruning. In a luxuriant crop the growing points of the long trailing stems may be pruned off without damaging the crop in any way. These prunings provide in native households a delicate vegetable.

Signs of ripening. It is not easy to determine when the crop is fully ripe. The stems or vines do not die down completely. Many of the leaves, however, turn yellow and drop off. The stems near the growing point get hard and fibrous. Such are the observable signs of maturity. The vines should be reaped close to the ground, cuttings selected for the nursery and such of the vines or portions thereof as are green and succulent used as cattle fodder. As the crop approaches maturity, irrigation water should be withheld.

Harvesting. If the soil is fairly dry and not sticky or adhesive, the crop can be dug out in clean condition and easier than from moist sticky soil. A pick with iron piece about 15 inches long is used for digging the crop, and in the hands of an expert labourer is very effective for the purpose. A man who is used to garden cultivation knows intuitively where he should insert the pick to expose the tuber most easily. Harvesting is an expensive operation. A poor crop will not pay expenses, whilst a good crop yielding 6 tons per acre gives a valuable outturn worth at average market rates Rs. 300 per acre. The outturn, however, rarely reaches the above standard. A crop planted in October-November ought to be ripe in April.

Outturn. A crop test taken in the Surat District in 1895-96 yielded an outturn of 8,509 lbs. per acre, worth Rs. 203. This was the red variety. The white variety on the Surat Farm

in 1899 yielded 8,560 lbs. tubers per acre. The red variety on the Poona Farm in 1901 gave 12,358 lbs. per acre.

The vines or haulms should be reaped before the tubers are dug. The vines, if fairly green, are greedily eaten by cattle.

Economic uses.

Sweet potatoes provide a favourite food in both native and European households in India. The tubers are generally cut lengthwise in two parts, and either boiled, roasted or fried. Dried tubers are sometimes ground into flour which is baked into cakes and eaten by Hindus on fast days.

Cost of Cultivation, Surat District.

	Per acre. Rs. a. p.
Manure—30 cart-loads ordinary manure and spreading ...	16 0 0
Preparatory tillage—6 ploughings with *hal*, 2 harrowings and levelling with plank roller	6 8 0
Ridging, making beds and water channels	4 8 0
Cuttings and cost of seed bed	7 0 0
Planting cuttings	7 8 0
Hand weeding	1 8 0
Turning over vines to prevent rooting—twice done	1 0 0
Irrigation—20 waterings in fair season	60 0 0
*Removing vines, hand digging crop and cleaning tubers in medium black soil	30 0 0
Rs. ...	134 0 0

THE YAM—*Dioscorea.*

Natural Order—*Dioscoreæ.*

Gujaráti, *Ratálu*; Maráthi, *Konphal* or *Gorádu*; Kánarese, *Heggenasu.*

General character of the plant.

The tuberous root stocks of various species of *Dioscoreæ* are known as yams. These are climbing herbs or small shrubs with twining stems. The stems may be round, four angled or six or more angled. The leaves are cordate, acuminate, net veined, stalked, and, when young, sometimes very brightly coloured; the flowers are unisexual, dicœceous and small. The tubers may be produced on the stems, as well as under ground. Some species yield tubers which are bitter and uneatable until rendered wholesome by being steeped in water or in water and ashes before being cooked. Others never lose their bitterness. The tubers of different varieties vary much in size, shape and colour. The colour may be white, yellow, red or purple. The darker skinned tubers have their flesh tinged with a lighter shade of the same colour. A white skinned variety may be yellow inside. The shape may be oblong, oval, round or kidney shaped. The size varies.

Several varieties are found wild in India. Some of the cultivated varieties have been introduced. Dr. Watt names 24 species, ten of which are extensively cultivated in India.

Bombay varieties.

Four varieties at least are grown in the Deccan and Gujarát:—

* Operation cheaper in good, alluvial, garden land.

(1) *Dioscorea alata*, Roxb., *Kham dlu*.—Has a white fleshed, oblong tuber, which, under favourable conditions, grows to a large size. The stems are four angled. The trailing vines should be trained on poles or in any other convenient way. The tuber is of fair quality. Two or more are found at each root.

(2) *Dioscorea globosa*, Roxb., *Chupri álu (Kamodio*, Gujaráti*)*.—This variety has white fleshed, rounded tubers which grow to a size of 8 to 10 lbs. in good, well manured soil. The plant has a six angled stem. The *Kamodio* variety of Gujarát is considered of good quality. It has a fragrant smell like *Kamod* rice when boiled, hence the name.

(3) *Dioscorea purpurea*, Roxb., *Lál álu, Talabda ratálu*, a local variety of Gujarát.—The tubers are long, large in the middle, and taper to each end. Good specimens weigh 7 or 8 lbs. One large tuber or two or more smaller ones form at each root. The skin is dull purple. The flesh is tinged with red, but nearly white at the centre.

(4) *Dioscorea sativa*, Linn.—This is the commonest of the yams. Its quality is not so good in native estimation as the three others named above. The *Bhusra* variety of Gujarát probably belongs to *D. sativa*. It is long and thick, but does not bulge in the middle. The flesh is white. The skin is dark dirty brown. This is considered a coarse, inferior variety but it grows to a size of 8 to 10 lbs.

Two other varieties are common in the Southern Konkan :—

(1) *Dioscorea aculeata*, Linn.—The prickly stemmed yam or Goa potato, called *Kangar* by the natives. The tubers of this variety are white, of fine quality, oval in shape and not large. The stems have prickles, and need not necessarily be supported by stakes. The crop is ready in six months if planted in June, and produces a cluster of kidney shaped tubers at each root. This variety is a native of various parts of India.

(2) *Dioscorea bulbifera*, Linn.—Wild on the Western Ghâts and elsewhere in India. It is called *Karanda* in the Konkan. This variety produces bulbs on the stems. These, as well as the underground tubers, are yellow fleshed. The wild variety is acrid, and requires steeping before boiling to remove the bitterness.

Distribution in Bombay.

The area under yams is not separately returned. The crop is sparingly grown in most districts. The cultivation in the garden lands of Gujarát is most important.

Soils; rotations; mixtures; season.

The yam likes a deep, free working, sandy, loam soil, well stocked with manure. It grows fairly well in soils of a still heavier character. It is seldom grown alone, and is most generally a subordinate crop to ginger and turmeric. It is grown with these crops in the rotations of garden lands already described. The yam is essentially a rain crop, but generally needs irrigation to bring it to maturity.

Methods of propagation.

The crop is propagated in various ways. The only method followed in this Presidency is to cut up a large yam into sets, or use small tubers as such. Each set is separately planted. The Chinese have an ingenious plan of producing a large crop of small tubers. The long trailing vines from one set are

layered to the soil at points where it is desired they should take root. The stem roots at a node, and, where it roots, a cluster of small tubers is produced underground. These are much the size and shape of common potatoes. This method of growing the crop obviates the necessity of training the vines. The plant may be propagated from the aerial tubers or bulbs. These, if planted as sets, produce a mature crop in two years. This method is not practised in Bombay.

Cultivation in Gujarát.

The crop participates in the tillage given for ginger or turmeric, as already described. The sets consist of pieces of tuber. A fairly large, oblong tuber can be cut into about eight sets. A small tuber may be planted whole. The beds are 12 feet × 6 feet, and round the borders of each bed ten sets are usually planted, one at each corner, two at equal intervals at each side, one intermediate at each end. The sets are put in pits 4″ deep dug with a pick, and, when planted, are carefully covered. They are distant from each other 3 feet. A set rarely fails to grow. The stems are generally allowed to trail and twine through the ginger and turmeric in the beds. They are not usually supported by stakes. Large, very well developed tubers are got when the stems are trained on a support. If the stems grow vigorously, the tubers are certain to be well developed, and a support certainly helps to produce luxuriant growth of the stems and foliage. The crop is ripe when the foliage dies down. The tubers are generally dug out in December-January, and in doing so a pick is used to move the earth to a depth of 15″ to 18″.

Cultivation in varkas land.

In the *varkas* lands of the Konkan the crop is sometimes grown alone, the sets are planted 3 feet apart, and the same distance between the rows. Poles are used to support the vines. The cultivation is not very careful. The natural rainfall is sufficient. The crop ripens in October. In the Konkan the outturn is 6,000 to 8,000 lbs. per acre, but a crop subordinate to ginger or turmeric would yield more. Yams subordinate to turmeric yielded on the Poona Farm in 1901 9,360 lbs. per acre, the gross produce of turmeric and yams being over 20,000 lbs. per acre.

Value.

Yams in Gujarát as sold by the cultivator to the dealer are worth 50 to 60 lbs. per rupee in average seasons.

In Dr. Watt's "Dictionary of Economic Products" an interesting account by Mr. R. Mitchell, of Calcutta, is given regarding the cultivation of recently introduced West Indian and other varieties. I summarize briefly his results.

Mr. Mitchell's method of cultivating West Indian varieties.

The experimenter's object was to introduce varieties of finer quality than the stringy, hard and earthy flavoured sorts commonly grown. He succeeded in acclimatizing some at least of the improved forms, and, though these produced large sized tubers (one weighed 82 lbs.), the fine, mealy quality and delicate flavour were maintained. Mr. Mitchell gave special care to the preparatory tillage, and believes in deeply trenching the soil and placing in the bottom of each trench a quantity of decayed or decaying vegetable material. The effect is to produce a seed bed, pulverized and open to a depth of 18 inches, which, moreover, is full

of organic matter. It can be readily understood that yams or, indeed, any tuber bearing crop will succeed in land prepared in this manner. The friable open soil permits the tuber to freely expand. The sets about the size of a man's fist cut so as to preserve as much of the out surface as possible, are planted 3 feet apart in each direction. They should be first made to sprout under a layer of grass and earth, occasionally watered. They sprout in three to six weeks, and should be planted out at once. The vines should be staked. On the plains with a well distributed rainfall of 50 inches or more the acclimatized West Indian yams require seven to eight months to mature, and have produced at the rate of 8 tons per acre. Mr. Mitchell does not think that the imported yams will succeed at any altitude above 3,000 feet.

POTATO—*Solanum tuberosum*—Linn.

Natural Order—*Solanaceæ*.

Gujaráti, *Patáta*; Maráthi and Kánarese, *Batáte*.

Habitat.

The potato is believed to be a native of Chili. It was introduced into the United States and Europe in the latter half of the Sixteenth Century. It was brought to India at a much later date probably by the English.

Distribution.

This crop is widely grown in India, but not nearly so successfully in the plains as in the hills. Excellent potatoes are grown in the lower slopes of the Himálayas and on the Nelgherries. The Mahábleshwar hill potatoes of the Bombay Presidency are of excellent quality and of large size. Potatoes are grown sparingly in garden lands in all parts of the Presidency. The chief cultivation is in the Poona District which claims 75 per cent. of the total area. Fairly large areas are grown in Ahmednagar, Sátára, Dhárwár Surat, Kaira and Ahmedabad. The total for the Presidency for 1898-99 was 9,400 acres.

Soils; seasons; rotation; mixture.

The potato is always grown alone and generally as a *rabi* irrigated crop. It is essentially a light or free working soil crop. It succeeds best on naturally well-drained, deep, sandy loams, such as are found in the garden lands of Surat and Kaira. This crop thrives excellently in the sandy beds of the Sábarmati and other rivers in Gujarát when the streams get low in the fair season. In the Poona District it is rotated with onions, garlic, irrigated wheat, irrigated gram, groundnut and dry crop *bájri*. In Gujarát it takes its place among the numerous other garden crops which are grown.

Varieties.

The varieties in cultivation in Europe and America are exceedingly numerous. There are early, medium and late ripening sorts. They vary exceedingly in size, shape, colour of skin and colour of flesh on section. The skin may be rough or smooth. The eye buds may be numerous or few, and the eyes may be deeply indented or shallow. The colours of varieties are exceedingly various. Many are white or dull yellow, some blue, some all shades of red, one almost black, and one coloured in patches red and white. The colour of the skin may or may not extend into the flesh.

Quality.

Potatoes of fine quality are usually of moderate size (three to the pound), regularly rounded, or oval in shape; skins rough. Eyes shallow and not numerous. The flesh on section should be white or creamy white. A yellow fleshed potato is usually inferior in quality and waxy in consistence when boiled. A white fleshed potato, if of good quality, should crack when boiled (burst its jacket), and, when peeled, should present a granular or mealy appearance.

Varieties which have long been cultivated are degenerated and become more and more liable to disease.

The seedsmen and gardeners of Europe and America produce new varieties annually. Such new varieties are obtained by cross-fertilization and by propagating from the true seed. They are less subject usually to disease than varieties which have been long cultivated. Potatoes are usually cultivated from cuttings or sets obtained by sub-division of the tuber. If this method of propagation is carried on for a number of years, any variety will degenerate, and become more and more susceptible to disease. This degeneracy may be arrested or postponed by change of soil, change of climate, change of district. Ultimately, however, the variety deteriorates to the extent that, it is not worth cultivating, and a new sort must be obtained.

The propagation of new varieties.

In temperate countries the potato produces flowers freely. In the plains in India potatoes rarely produce flowers. By artificial cross-fertilization a European gardener often fertilizes the flower of one variety with the pollen of another. The fruit which is produced will contain hybrid seed. The fruit of the potato is provincially called a plum. New varieties are obtained from the seeds enclosed in the plum. The plums are allowed slowly to decay. The decayed pulp is washed away, and small white seeds are left behind. New varieties are obtained from these seeds. The seeds should be artificially germinated in folds of blotting paper, kept moist, but not too wet. As each seed is seen to strike, it should be gently removed and planted, in India, in a flower pot containing well-manured, fine, sandy soil. The flower pots should have free exposure, but be protected from heavy rainfall or severe weather. The seedlings, although protected as described, should otherwise be grown under as natural conditions as possible. Only a few seedlings out of many thousands are usually found useful for continued cultivation. The most vigorous growing and healthy should be selected. These produce in the first year small tubers, varying in size from a pea to a small marble. These tubers, if planted under favourable conditions, produce larger tubers in the second year. In three or four years by careful cultivation potatoes of natural size may be got.

The Poona method of cultivation.

The soil is mixed black, and the field is usually fallowed during the rains. Two or three ploughings are given between June and September. Old farmyard manure at the rate of thirty to forty cart-loads (15 to 20 tons) per acre is applied, and evenly spread before the third ploughing. The bladed harrow is afterwards worked. The manure is thus freely mixed through the soil, and a fine tilth obtained to a depth of 6″ to 8″.

The seed rate.

Potatoes are ready for planting when the eye buds are freely started into growth. Tubers of medium size are selected for sets, and each is cut into three or four pieces. 900 lbs. to 1,100 lbs. of potatoes furnish sets sufficient to plant an acre. The sets are planted in the furrows made by

an ordinary country plough. The plough works about 4″ deep. The sets are planted 7″ to 8″ apart, and are covered by the soil moved in making the next furrow. The furrows are 9″ to 10″ apart. Beds are formed along the line of furrows 3½ feet wide. If the surface of the field is fairly level, the beds extend the whole width of a small field; if the surface is uneven, the beds are of variable length. A wooden hoe is used to smooth the surface of the beds and form the ridges which divide the beds from each other. There are four rows of potatoes in each bed. The crop is kept clean by frequent hand weeding with the weeding hook (*khurpa*) Irrigation is given every eight days. The water is directed into each bed in turn, and should flow slowly from the higher to the lower end of each. The crop is planted in October.

The seed rate.

In March the haulms begin to wither and turn brown. Water is now withheld for a fortnight or three weeks. When the soil is sufficiently dry, a plough is used to raise the crop. It is first worked along the rows. The tubers which are exposed are gathered by women and children. The field is next cross ploughed, and any exposed tubers again gathered. The field is ploughed a third time diagonally, and this exposes all or nearly all the tubers on the surface.

Harvesting.

The potatoes are sorted into three sorts when gathered—(*a*) large, (*b*) medium sized, (*c*) small and diseased. The large potatoes are sold, the medium sized potatoes reserved for seed, and the small, etc., used for home consumption. Those which are stored are exposed under shade until quite dry.

Sorting for market, etc.

A fair average crop tested in the Poona District in 1892-93 by the writer gave the following outturn, etc., results :—

Outturn value.

Local Estimates in Annas.	Outturn per acre.	Value per acre.
	Lbs.	Rs.
12 (average crop)	10,230	201

Cultivation in Gujara't.

The preparatory tillage and the amount of manure given are much the same as already described. A fine deep tilth is necessary, and is generally obtained. The last tillage operations before planting are to form ridges and furrows, about 15″ apart, with a plough, and draw deep cross furrows with the plough, 10 feet apart, for water channels. A hand spade is used to form water compartments about 10 feet square. The manner in which this is done has already been fully described under sweet potatoes and other crops. Pits 3″ deep and 9″ apart are dug in the furrows. A set is planted in each, and carefully covered. The beds are immediately watered.

Italian potatoes which are imported annually are extensively planted in the Surat District, and grow particularly well. The Italian potatoes are fairly large. They are cut up into sets for planting, and 1,400 to 1,600 lbs. per acre are required. The local varieties are much smaller, and of these 1,000 lbs. provide sufficient sets for an acre.

Seed rate.

Hand weeding with the *khurpa* must be early attended to. As the young plants grow, they are earthed up by hand by splitting the ridges into the furrows. This is done gradually, and, when complete, the plants which originally occupied the furrows now grow on ridges, or the beds are left flat.

Culture during growth.

The crop if planted in October is ripe in March, and is then dug out by hand with a medium sized, blunt pick.

Harvest.

An excellent crop of Italian potatoes was tested in a rich garden village in the Surat District by the writer in 1893-94, and gave the following results :—

Outturn and value.

Anna Estimate.	Outturn per acre.	Value of Outturn per acre.
	Lbs.	Rs. a. p.
14 (12 average crop)	15,321	384 2 0

I am not sure that the Surat method of growing Italian potatoes can be improved upon in the plains, particularly if, as is occasionally done, the plants are properly earthed up during growth. The short distance between sets and between furrows will strike a European agriculturist as being too small. The heat of India in the plains forces potatoes even in the cold weather prematurely to maturity, and the tubers are necessarily smaller than those produced in a more temperate climate. The closeness of planting need, therefore, not be seriously questioned. The advantage of growing potatoes in ridges rather than in furrows or in flat beds cannot, I think, be disputed. The plant luxuriates naturally on sunny slopes and well drained situations, and it is reasonable to suppose that it cannot thrive properly in the flat irrigated beds in which it is usually grown in India. In any case I believe that indigenous varieties if planted in beds are more subject to disease than if planted on ridges. As regards newly imported good varieties there can be no doubt that the ridge system of planting is best. There is, further, no doubt that the small cut sets used by native cultivators induce weak growth and that larger cut sets or, better still, medium sized whole potatoes produce more vigorous growth and better crops. An experiment in 1892-93 conducted by the Bombay Agricultural Department gave the following results in comparative plots :—

Improvements in cultivation suggested.

The ridge and furrow system of planting.

The value of new varieties.

Whole sets better than cut sets.

	Seed rate. Per acre.	Outturn. Per acre.
	Lbs.	Lbs.
Cut sets	1,563	10,065
Whole sets	1,437	13,509

Whole sets should be $1\frac{1}{4}$" to $1\frac{1}{2}$" in diameter.

The ordinary farmyard manure dressing is not the best application for potatoes. This crop, like its near relatives, tobacco, brinjals, and chillies, is specially benefited by potash manures; therefore, household ashes and crude nitre might with every advantage be used in top dressing the crop before it is fully earthed up, a moderate application of well rotted farmyard manure being given, as usual, before plantation.

Manure.

Potato disease.

In the Poona District and elsewhere in India the potato crop became infected with a fungoid disease, about 1890, which was locally called *bángdi* owing to the appearance of a dark ring easily visible in the substance of the potato on section. This disease shows its first effect by a sudden withering of the stems. About an inch below the surface the stem is found stained brown. Decay rapidly proceeds, and extends upwards and downwards along the fibro-vascular tissues. It finally enters the vascular tissues of the tuber, hence the observable dark ring. The spores harbour in the soil from year to year, owing to remnants of previous crops, and this is a certain source of contagion. The obvious remedy is to grow potatoes at long intervals on the same land, but this the cultivators refuse to do.

Effective remedies.

Experiments conducted by the Bombay Agricultural Department proved that certain imported varieties at first resisted infection in a marked degree, but, when cultivated in India for a few years, deteriorated, so that they were not immune. The flushing of the land before plantation with irrigation water containing a weak solution of copper sulphate was proved specific as regards all diseased germs which it reached, but the operation was expensive. 84 lbs. of copper sulphate was used per acre. A crop grown on ridges from whole tubers was found much less liable to disease than a crop grown in flat beds from small cut sets, and this was especially the case if ample room was allowed between plants grown on ridges.

Very good undiseased crops were obtained from newly imported seed on diseased land. The best results were as under :—

	Seed rate.	Outturn. Per acre.
	Lbs.	Lbs.
Sutton's Early Regent	1,180	16,871
Do. Windsor Castle	1,361	14,365

Potato blight.

The potato blight of Europe—*Peronospora infestaus*—is not known in the Bombay Presidency. It is a fungoid disease which fructifies on the foliage. The spraying of the foliage with copper sulphate solution with quick lime (*Bouillie Bordelaise*) has curative, as well as preventative, effect. The proportions of ingredients for an acre are as under :—

45 lbs. sulphate of copper.
22½ lbs. quick lime.
22 gallons of water (2,200 lbs.)

The sulphate should be dissolved by hanging it in a coarse cloth or basket in water contained in a wooden vessel. Hot water acts more quickly. The quick lime is slaked in a separate tank, and then stirred into a fine gruel with added water. This should be passed through a sieve into the solution, well stirred, and the remaining water added.

Bouillie Bordelaise is a safe and effective application for any fungoid disease which fructifies on the foliage of any crop.

Storing potatoes.

The crop should be dead ripe when harvested, otherwise the tubers will not keep well. All broken, bruised or diseased tubers should be separated. The potatoes when lifted should be kept exposed for several days under a shady tree or other

shade until quite dry. Full exposure to the sun is harmful. Large quantities should not be stored in one heap, particularly if there is any suspicion that some of the tubers may be unsound from undeveloped disease. In Gujarát potatoes are stored in uncovered heaps in the cool central room of the house. A layer of fine dust taken from the sandy roadways is formed on the floor. Over this the potatoes are heaped and freely mixed with the fine dust. The heap is turned every ten days. Tubers which show signs of decay are removed. The whole stock is sold off before the monsoon. It is very difficult to store potatoes successfully during the rains, because they sprout freely and shrivel up.

Cost of Cultivation, Surat District.

	Per acre. Rs.	a.	p.
Ploughing six times with a light *hal*	6	0	0
Manure—40 full cart-loads	30	0	0
Working harrow twice	0	8	0
Levelling and clod crushing	0	8	0
Making beds and water channels	3	8	0
Digging pits for sets; planting and covering sets ...	3	0	0
Cost of sets 1,200 lbs. (potatoes dear at planting time) ...	40	0	0
Hand weeding and stirring surface soil with *khurpa* twice	3	0	0
Irrigation—11 waterings during growth; (one pair of bullocks and three men, steadily employed, will irrigate 4 acres)	32	0	0
Harvesting, digging, sorting, carting, etc.	12	0	0
Rs. ...	130	8	0
Outturn, say, 12,000 lbs. at wholesale rate of 60 lbs. per rupee	200	0	0

CAYENNE PEPPER OR CHILLIES—*Capsicum.*

Natural Order—*Solanaceæ.*

Gujaráti, *Marcha;* Maráthi, *Mirchi;* Kánarese, *Menshinkái.*

Four species of this genus are known in India, *viz.*:—

Capsicum minimum, Roxb., bird's eye chillie.

Capsicum grossum, Wild, bell pepper.

Capsicum annum, Linn., Goa or red pepper.

Capsicum frutescens, Linn., the shrubby or common chillie.

Only the two last are much cultivated in India.

Habitat.

The home of the common Indian variety (*Capsicum frutescens*) is believed to be in tropical America. Chillies were introduced into India in comparatively recent times probably by the Portuguese.

General character of the plant.

The plant is an annual. It varies in size according to variety. The varieties of *C. frutescens* grown throughout the Presidency range in height from 18″ to 3′. They are much branched shrubs, with small leaves and very numerous, small, white flowers. The fruits vary in size and colour according to variety. The colour may be dark red, red orange or yellow.

Bombay varieties.

The *Deshi* variety of the Deccan has a small, red, pungent fruit, gradually tapering from a blunt base to a sharp point. The *Deshi* variety of Northern Gujarát is large, thick, irregular in shape, inflated, sometimes curved, not very pungent and red in colour. A variety with small, red, pungent fruit, similar to the *Deshi* variety of the Deccan, is also cultivated in Northern Gujarát. The *lavengia* variety of Surat has small, orange coloured, very pungent fruit. It takes its name from the Gujaráti word *laveng* (a clove). This variety probably belongs to *Capsicum minimum*. The *bor mirchi* gets its name from its resemblance to the fruit of the *bor* tree (*Ziziphus jujuba*).

Distribution.

The Bombay Presidency area in 1898-99 was 135,000 acres. The Dhárwár cultivation is by far the most important. Belgaum comes next. Khándesh, Sátára, Poona and Sholápur grow 8,000 to 12,000 acres each, Násik and Ahmednagar about 5,000 acres each. In Gujarát the crop is not of much importance.

Season; mixtures; rotations.

The crop is invariably planted in the rains, but, if helped by irrigation, the growth extends into the *rabi* season. Chillies are grown to a large extent alone, but are also planted along the ridges and at the corners of the beds, subordinate to many garden crops, such as ginger, turmeric, potatoes, onions, garlic, etc. In the Deccan chillies are rotated with onions, potatoes, groundnut, irrigated wheat, gram, etc. In Gujarát the crop is rotated with the numerous other garden crops grown, but in particular with brinjals, turmeric, sugarcane and *surans*.

Soils.

The best dry crop chillies are grown on deep retentive black soil. The irrigated crop is grown in the Deccan in mixed black soil. In Gujarát the best crops are got in *besar* (clay loam) soils. The Bombay market is largely supplied with chillies grown without irrigation in the deep black soils of the Krishna Valley.

Cultivation in the Deccan.

The irrigated crop is only grown by well-to-do cultivators who can afford the liberal management which the crop needs. Chillies are grown from transplanted seedlings. The seedlings are raised in a nursery. This seed bed is got ready in May. It should be in a sheltered position. The soil should be in a very fine state of tilth when the seed is sown. The seeds are very small, and should, before sowing, be mixed with powdered earth or ashes to secure even distribution. The seedlings should come up thickly, but should not be overcrowded, or they will grow tall and weak and not easy to transplant successfully. 1 to 1½ lbs. seed will give seedlings sufficient for an acre. The seed when sown should be lightly covered with soil. The seed bed should be covered with light branches, leaves, or straw to protect the seedlings from the sun. These are delicate at first, and it is therefore preferable to water by hand rather than irrigate from a channel. They get hardier when about three weeks old, and are ready for transplantation when six weeks old and 6 or 8 inches high.

The seed bed.

Cultivation of the field.

The plough should be worked two or three times. The manure (15 tons at least per acre of old farmyard manure) should be spread before the first ploughing. The bladed harrow should be used frequently after the plough until a fine

friable tilth to a depth of 4″ is obtained. In a district of light rainfall beds for irrigation should now be formed. In a district of moderate or heavy rainfall this operation should be deferred until the end of the monsoon. The small Deccan variety of chillie should be planted 18″ apart in the rows with the same distance between rows. Three or four seedlings should be planted together, care being taken that the seedlings are lifted from the seed bed without damaging the roots and that transplantation is properly done. The seedlings are best transplanted in the evening in cloudy weather. If there is a shower during night or light rainfall next day, the operation is sure to be successful; but, if bright sunshine for several days follows transplantation, many of the seedlings will die. These must be replaced as expeditiously as possible. The rows of plants should be accurately straight, so that the bullock hoe can be used for inter-culture if beds for irrigation have not been formed. If the land is laid out for irrigation, the surface soil is stirred, and weeds removed by means of the weeding hook (*khurpa*). When the plants are fairly established, they should be earthed up. A little mound of soil is formed round each clump of plants. During prolonged breaks in the rains irrigation must be given, and, when the rains cease, a watering is necessary every eight or ten days.

Harvest.

About three months after planting, the first fruit forms. If the field is regularly irrigated, the plants will go on bearing for five or six months, and this period may be prolonged by stimulating the plants with a top dressing of castor cake of 600 lbs. to 1,000 lbs. per acre given in September-October. In a district where there is a good demand for green chillies these should be picked three times a month at the beginning of the season and at longer intervals afterwards. Ripe chillies are picked three times or oftener during the fruit season as they mature.

Gujarát cultivation.

The cultivation in Gujarát is somewhat different from that in the Deccan. During the early monsoon the field is ploughed three or four times often enough to bury the manure (thirty cart-loads per acre) and produce a good tilth. When the seedlings are 9″ to 12″ high and two months old, they are transplanted into rows 3 feet apart with a like distance between plants. The plants grow to a height of 3 feet, and require plenty of air space. Three to five seedlings are put in each hill. The bullock hoe (*karabdi*) is used as soon as the plants are fairly established. This implement is worked lengthwise, as well as across the field. Any weeds not reached are removed by the weeding hook (*khurpa*). The surface soil should be moved with the *karabdi* as soon as dry after each succeeding shower of rain. This implement, if yoked with a steady pair of bullocks, may be worked advantageously up to the time the flowers begin to appear. Then the plants should be earthed up, beds for irrigation should be formed, and all tillage should cease.

The crop is prepared for market by laying the pods out on mats to dry in the sun. In the Deccan they are usually exposed on sheet rock near the cultivator's home. When comparatively dry, they are sown up as tightly as possible in coarse sacking in bundles of four or five bushel capacity, and carted to market.

Uses.

Chillies are used in *chatnis*, pickles and Indian condiments, and also medicinally. Cayenne pepper is made by grinding to a powder the ripe pods of red pungent varieties. Nepaul pepper is similarly obtained from a mild flavoured yellow fruit.

BRINJAL OR EGG PLANT—*Solanum melongena*—Linn.

Natural Order—*Solanaceæ*.

Gujaráti, *Vengan*; Maráthi, *Vánge*; Kánarese, *Badnikái*.

Habitat. This plant is believed to be a native of Asia (De Candolle). Other authors believe it to be of Arabian origin.

It is cultivated all over India, "and is often met with as an escape from cultivation, in which condition it becomes more prickly and more prolific as to the number of fruits." (Duthie.)

General character of the plant. The Bombay varieties with large purple fruit grow into much branched shrubs about 3 feet high. The small fruited varieties are not so tall, but have the same branching habit of growth. The leaves have a peculiar greyish green colour. The Bombay field varieties have all prickles. "Leaves ovate, sinuate, or lobed, clothed beneath with stellate hairs flowers bluish, arranged in extra-axillary cymes, usually only the lowest on the cyme becoming fertilized, fruit or berry, round, oval or elongate, cylindrical." (Duthie.)

Bombay varieties. The commonest variety has very large purple fruits, tapering gradually from the attachment to flower stalk to a round, full, thick end. Well grown fruits are each 10″ to 12″ long. Another variety has very large, round, purple fruit, about the size of a pumalo. A favourite variety in the Surat District has nearly round or slightly oval, small, purple fruit, about the size of an orange. This is considered a more delicate vegetable than the others, and commands a higher market rate. The three varieties named represent the usual sizes and shapes of brinjal fruit, but, according to variety, the colour varies from purple to variegated purple and green or yellowish green, faintly marked with purple.

Distribution. The crop is grown sparingly throughout the Presidency in all garden lands, but the chief cultivation is in Gujarát, particularly in the *gorádu* or *besar* garden lands of Kaira and Baroda Territory.

Soils; season; rotation; mixtures. Brinjals, like chillies, grow most successfully on the heavier descriptions of soils which can be successfully irrigated. The crop is always grown alone and in the rains. Its growth extends into the *rabi* season if helped by irrigation. The rotations are the same as described for chillies.

Cultivation. The seed bed. The crop is grown from transplanted seedlings. The seed bed is got ready in May, and should be carefully prepared and liberally manured. The seed should not be broadcasted too thickly. The seedlings require more room in the seed bed than chillies. They are ready for transplantation when six weeks to two months old. They should then be well rooted, with stout stems, and about 6″ to 8″ high.

The field. A heavy dressing of manure is necessary, not less than 20 tons old farmyard manure per acre or a less quantity if supplemented by a subsequent top dressing of oil cake, nitre or other quick acting concentrated manure. The same preparatory tillage as described for chillies is required.

The seedlings of the large varieties are transplanted two together in a hill, 3 to 3½ feet apart in the rows and the same distance between rows. The smaller varieties should have a space of 2½ feet between plants in each direction. The interculture for brinjals and the weeding and earthing up should be done precisely as described for chillies. A top dressing of nitre or castor cake at the rate of 500 lbs. of the former or 1,000 lbs. of the latter per acre will be found very beneficial. This should be given round the plants before they are earthed up. Beds for irrigation and regular watering when required should be arranged for in the same way as described for chillies.

Harvest.

The crop should begin to bear in October, and continue in bearing for several months. The fruits in a well nourished, vigorous crop form and ripen with great rapidity, and should be plucked every second or third day.

The following tabulated results show that nitre as a top dressing has a remarkable effect on the brinjal. It is possible that the potash of the nitre was as effective as the nitrogen. We know that potatoes, tobacco and chillies—near relatives of brinjal—are specially benefited by potash manures. The results are from comparative plots on the Poona Government Farm :—

Kind of Manure.	Quantity of Manure per acre.	Outturn per acre.	Cost of Cultivation per acre.	Value of Outturn per acre.	Remarks.
	Lbs.	Lbs.	Rs. a.	Rs. a.	
Dried Fish	1,451	16,322	138 6	325 5	Comparable.
Nitre	433				
Dried Fish	1,451	11,400	79 9	227 3	
Dissolved bones ...	1,651	11,700	224 11	233 2	Comparable.
Nitre	433				
Dissolved bones ...	1,651	7,882	165 2	157 2	
Castor-cake	1,488	15,080	182 11	300 10	Comparable.
Nitre	544				
Castor-cake	1,488	7,546	81 14	150 7	

The variation in cost of cultivation between plots was almost entirely due to difference in value of manures applied and the difference in cost of gathering the fruit. Nitre is exceedingly dear in Poona. Yet for this crop a moderate application will apparently pay well.

A risky crop.

The brinjal is a risky crop in districts of heavy rainfall. The young plants die in heavy soil during heavy rainfall. This plant, like chillies, is subject to a curious malformation of the branches and leaves. Affected plants produce no fruit.

THE ONION—*Allium cepa*—Willd.

Natural Order—*Liliaceæ.*

Gujaráti, *Kándo;* Maráthi, *Kánda*; Kánarese, *Ullágadde.*

Habitat. The onion has been cultivated from very ancient times. It is found wild in Afghanistan and Beluchistan, and may be indigenous also in Palestine. (De Candolle.) The plant is largely cultivated all over India, and is an important market garden crop in the Bombay Presidency.

Distribution in Bombay. The area in the Presidency is not separately returned. The crop is grown to some extent in all districts. The cultivation is most important in the garden lands of Gujarát, in the Dhulia Táluka of Khándesh, and in the Khed and Junnar Tálukas of the Poona District.

Soils. Onions succeed best in free working, well drained soil of fair depth. The mixed black soil of the Deccan, on which other irrigated crops are grown, suits the crop very well.

Season; mixtures. Onions are only grown alone, and always as a cold weather irrigated crop.

Rotations. In Gujarát the crop is rotated with the numerous other irrigated garden crops. In the Deccan it is rotated with potatoes, chillies, groundnut, irrigated wheat and gram, garlic, sweet potatoes, etc.

The land is occasionally rested from irrigation. Then dry crops of *jowári* and *bájri* with subordinate mixtures are grown.

Varieties. Three chief varieties are grown in the Presidency: a large red and a large yellow variety and a smaller pure silvery white variety. The common red variety is very strong flavoured. It has a red tinge inside, but towards the centre the bulb is nearly white. The yellow onion is also strong flavoured. It has creamy white flesh. The white onion is extensively grown at Dhulia, and its cultivation is extending in other parts of the Presidency. It is mild flavoured. The smaller bulbs are suitable for pickling, and there is a considerable and increasing export trade in this variety on account of its fine mild flavour.

Introduced varieties. It is probable that these varieties were obtained originally from imported seed. It is, however, difficult to successfully import seed of good vitality. European seed ripens in the autumn, and therefore cannot be imported into India soon enough for the crop of that year; and onion seed loses vitality so quickly that in the following year few, if any, of the seeds would germinate. Possibly, however, sound seed might be obtained by planting imported bulbs, and the experiment is certainly worth trial.

Onion seed. Onion seed is produced in India as follows:—Well developed bulbs are selected. These before planting are cut in two with a knife; the top part to the extent of a quarter of the bulb is cut clear away. The "but" ends are planted 6" apart in beds, the soil of which by previous tillage has been thoroughly

well prepared and liberally manured. Several shoots with flowering heads should spring from each bulb. These ripen in February-March, and seed thus obtained will keep good until required for sowing for the main crop in the following September-October.

The seed bed.

The main crop in India is raised from transplanted seedlings. The seedlings are grown in a seed bed. There is a common English saying in regard to fine tilth, *viz.*, "Fine as an onion bed." This saying holds good all the world over. The onion nursery must be well dug, liberally manured, and be in a thoroughly friable condition. For this reason land which is distinctly loamy makes the most satisfactory seed bed. The seed should be thickly broadcasted in September, and lightly covered. 15 lbs. of sound seed properly distributed in a nursery will give seedlings sufficient for an acre of transplantation. The seed bed should be carefully weeded, and if the seedlings are too thick they should be thinned out, so that all grow into healthy, vigorous plants, such only being suitable for transplanting.

Cultivation of the field.

The preparatory tillage should be careful. Onions are sometimes grown after a rain crop of *bájri*. Well rotted farmyard manure at the rate of at least 15 tons per acre should be spread on the *bájri* stubble. The plough should now be worked two or three times, and then the bladed harrow. The stubble should be collected and burnt. Beds for irrigation should be formed when the surface soil has been worked to a smooth, friable consistence.

Transplanting and subsequent cultivation.

The seed beds two or three days before transplantation should be freely irrigated. The soil is thus softened, so that the seedlings are easily uprooted. Half the length of the leaves or shoots should be clipped off, also long rootlets. If the soil is mixed black, the beds are generally irrigated before transplantation, and the seedlings are pushed singly into the soft mud about 4" apart. If the soil is a free working loam, the seedlings are carefully planted before the beds are irrigated; but, as each bed is finished, water is admitted at once. A second watering should be given four days after the first, and subsequently at regular intervals of eight days. Hand weeding should be given as required. A top dressing of ashes or of castor cake crushed to a fine powder has an excellent effect. The ashes or oil cake should be worked into the soil with the weeding hook (*khurpa*), weeds being removed during the same operation. The seedlings are generally transplanted late in November or early in December, and the crop is ready for lifting in March-April. It is ripe when the tops begin to turn yellow and fall down. The bulbs may be lifted about ten days after the last watering. They are easily uprooted either by hand or with a very light pick. They should be at once sorted and cleaned. The roots and tops are removed by means of a sharp sickle. A woman by means of her toes and foot holds the handle of the sickle securely on the ground. The blade of the sickle is presented vertically, and the woman using both hands presses each onion in turn against the sharp edge, first removing the roots, then the top.

Top dressing.

Harvest.

Outturn and value.

Two tests taken in 1894-95 on excellent crops at Khed (Poona District) gave the following results:—

	Outturn of Bulbs per acre.	Value per acre.
	Lbs.	Rs. a. p.
1st Test	35,022	235 0 0
2nd Test	34,514	228 0 0

The onions in the above tests lost by dryage 11 per cent. during 18 days' storage, and this is allowed for in the outturn figures. The wholesale rates for onions in the Poona District are generally low, the area being considerable and the produce much more than is required for local demand.

A curious method of cultivation.

Dhola (white) onions are grown in rather a curious way in the Surat District. The large onions of a crop are sold when lifted; the smaller are stored until the following November, and then planted. Each grows into a large single bulb or by sub-division into several small bulbs.

About 1,000 lbs. of small dry onions are sufficient to plant an acre. The field is prepared carefully and laid out into beds for irrigation. Small pits are dug 6 to 8 inches apart. The single small bulbs are planted one in each pit and carefully covered. After the first watering, the bulbs just show at the surface. Onions planted in this manner, if left alone, would, in due course, produce seed; but all flower stalks are removed, and as the crop ripens, bulbs are produced. The crop is harvested comparatively green. Each onion has, when lifted, a coarse neck and a good deal of green top. The tops are cut off close to the bulb, and left in the field to rot. These bulbs must be left fully exposed to the air for some time before being stored. They lose at least 25 per cent. of weight by dryage.

Cost of Cultivation, Surat District.

	Per acre. Rs. a. p.
Manure—30 loads ordinary manure and spreading	16 0 0
Preparatory tillage—six ploughings with *hal*, two harrowings and levelling with plank roller	6 8 0
Making beds and water channels and levelling beds	3 8 0
Cost of seed and seed bed	8 0 0
Transplanting seedlings	9 0 0
Weeding and loosening surface soil with *khurpa*	2 8 0
Irrigation—eighteen times	54 0 0
Digging up, removing tops and roots...	9 0 0
Rs. ...	108 8 0

GARLIC—*Allium sativum*—Linn.

Natural Order—*Liliaceæ*.

Gujaráti, *Lasan*; Maráthi, *Lasun*; Kánarese, *Belloli*.

Habitat.

De Candolle says that garlic is only found wild in the desert of Kirghis of Sungari.

General character.

This plant is perennial and closely related to the onion. "Its true stem which is much reduced gives off roots from the base, and supports as cauline appendages the overlapping scales (old leaf bases) which are thickened below and bear in

the axils small bulbs or cloves. These closely imbricating scales, together with the cloves and the reduced stem, form the bulb. The flowering stem or scape emerges from the centre of the bulb, and bears a few flowers, the majority being replaced by diminutive bulbs." (Duthie.)

The leaves are long, lanceolate, flat, sharp pointed. The sheaths enclose the lower half of the stem. The plants in a good crop grow to a height of 18". The flowers are small and white.

Distribution.

Garlic is cultivated all over India. In the Bombay Presidency the area in 1898-99 was 7,500 acres. The most important centres of cultivation are Belgaum, Dhárwár, Násik, Poona, and Sátára.

Season; soils; rotation; mixtures.

Garlic is generally grown alone and always as a cold weather irrigated crop, and does best under precisely the same conditions of cultivation, on the same kinds of soils and with same rotations as suit onions. These conditions have already been described in detail.

Cultivation.

The field is prepared, manured, and laid out for irrigation in the same way as for onions. The crop is propagated from the cloves. These are broadcasted very carefully in the beds in October, and lightly covered with soil. In a bed 10 feet square 1¾ lbs. of dry cloves should be sown. This gives a seed rate of about 700 lbs. per acre. The crop should be top dressed with manure, hand weeded and watered in the same way as described for onions. It ripens when the leaves turn yellow 4½ to 5 months after planting. The bulbs are lifted and prepared for market like onions.

Outturn value.

A good crop yields 8,000 lbs. to 10,000 lbs. per acre, and is worth at ordinary wholesale rates about Rs. 250 per acre.

COTTON—*Gossypium.*

Gujaráti, *Kapás*; Maráthi, *Kápus*; Kánarese, *Hatti.*

A genus of the natural order *Malvaceæ*, which is widely distributed in both hemispheres.

Habitat.

Cotton is chiefly grown in tropical or sub-tropical countries, but its cultivation extends south of the equator as far as the Cape of Good Hope. Various species are wild in India. The crop is very extensively grown in India. The annual area is probably about 14,000,000 to 15,000,000 acres.

Distribution in the Bombay Presidency.

The Bombay area in favourable years approaches three million acres, but contracts considerably when early rains are deficient or the season is otherwise unfavourable. Ahmedabad, Broach and Surat are the only cotton growing districts of importance in Gujarát. In the Deccan the Khándesh area is most extensive. But the crop is also important in Ahmednagar and Násik. In the Karnátak the crop is extensively grown in all the three collectorates, but most extensively in Dhárwár. No cotton is grown in the Konkan.

Soils; season.

The crop succeeds best on black soil of fair depth with a well distributed rainfall of 30 to 40 inches. It is grown entirely as a dry crop. The most suitable soil is known as "black cotton soil." Such soil may be 5 feet or more in depth as in Ahmedabad, Broach, Surat, and parts of Khándesh, Dhárwár, Bijápur, etc.; but the crop is also extensively grown on much shallower black soil. This is certainly the case throughout the Deccan and Karnátak. In Khándesh a considerable proportion of the cotton area is found on mixed black and reddish soils of no great depth. In fact, throughout the Deccan and Karnátak the crop is grown on the better classes of soils found in the rolling uplands, as well as on the true "black cotton" soil which is found usually in lower lying vales or plains.

Mixtures.

The crop is chiefly grown alone. In Broach, on very deep retentive black soil and with sometimes a rainfall heavier than the crop needs, rice in the same rows or in separate rows is often subordinate to cotton. A slight sprinkling of coriander and other condiments of similar class is often seen in cotton fields and in patchy crops. Sesamum is sown to fill vacancies, sometimes also gram (*Cicer arietinum*). These crops are chosen, because they are likely to succeed even if sown when the *kharif* season has well advanced or the *rabi* season begun. The perennial *rozi* cotton of Kaira, etc., is on *gorádu* or sandy loam soils, grown always as a row crop with *bájri*, pulses, etc.

Rotations.

Jowár is the principal rotation crop with cotton, but the ordinary cotton-*jowár* rotation is extensively modified according to district and season. Thus wheat as a dry *rabi* crop is grown extensively on the cotton soils of Ahmedabad. *Láng* and a mixed crop of *tuver* and sesamum as *rabi* crops are grown on cotton land in Broach, especially in years when the early rainfall is too heavy for cotton. Sesamum and wheat, as well as *jowár*, are regularly rotated with cotton in Surat. In the Deccan the rotation in lands which grow cotton is still more extended. *Jowár* is here also the chief crop, but *bájri*, sesamum, linseed, gram and wheat are also taken, as the character of the soil and the season may determine. In the Karnátak the cotton-*jowár* rotation is perhaps more strictly adhered to than elsewhere, still we have here also variety in such crops as wheat, Italian millet, castors and safflower, the latter, however, generally occupying separate rows with *jowár*.

Cultivation in Broach.

The general character of the soils.

The cotton soil of the district is deep and black, and rests on a deep substratum of yellow earth. The soil cracks freely in the fair season. It is very deep and very retentive of moisture. The annual rainfall varies between tálukas from 30 to 40 inches, but over the greater part of the district exceeds 35 inches on an average, and in occasional years is as high as 60 inches. Generally speaking, the cotton fields during the early monsoon rainfall get sodden with heavy rain, and are more or less unworkable for a time. The crop is sown as early as possible after the monsoon sets in, but, as a rule, two or more sowings are required

The value of rotation and special tillage and effect of season.

before satisfactory germination is secured. This is entirely owing to the effect of heavy rainfall on a very retentive soil. The seed is, therefore, generally more successfully sown in July than in June. Usually the same field grows cotton every second year. In intermediate years the field may be fallowed, or grow one or the other of the crops with which cotton is rotated. The character of the season determines to some extent the rotation crop chosen by the cultivator. The system of fallowing (*vâshil*) is extensively employed in Broach, and an exceptionally good cotton crop is generally got after a year's fallow. It is generally recognized that cotton on the deep fertile black soil of Broach and to a less extent in other districts is more benefited by thorough tillage than by applied manure. The fallow tillage is thoroughly done, and, when the monsoon rain comes, the soil of a *vâshil* field is clean and friable to a considerable depth. It soaks up the rain as it falls, and, when dry enough after rain, provides a seed bed in a perfect state of tilth. Cotton derives more benefit from residues of manure left in a soil than from manure directly applied. Cotton soil rarely gets manure oftener than once in three years in Broach or elsewhere. Fifteen loads per acre may be considered a full average application. If manure is used, it should be in a thoroughly decayed condition, and by preference should be applied before the rains come. It can be mixed with the soil by freely using the bladed harrow (*karab*). It is a risky operation on deep black soil to apply manure after the rains set in. A passing shower may interrupt the work, and the tillage required to mix the manure with the soil may delay sowing. Sowing should be pushed on vigorously when the soil is in a suitable condition, because a heavy shower of rain may interrupt field work for days. *Vâshil* fields can be more expeditiously sown than other fields, and this is one reason why the system of fallowing in Broach answers so well for cotton.

Preparatory tillage.

Tillage begins usually in the hot weather by collecting and burning the stubbles of *jowâr* or other previous crop. The preparatory tillage is least costly when cotton succeeds *lâng (Lathyrus sativus)*. The *lâng*, when harvested, leaves the field in as clean a condition as if it were fallowed. The soil, although it has cracked to a considerable extent, is on the surface fairly loose and friable when the *lâng* is reaped. Tillage should begin immediately. If the harrow is freely worked during the hot weather, a very fine state of tilth is produced. Cotton may on such land be sown in June as soon as sufficient rain falls. If cotton is taken after *jowâr*, more costly preparatory tillage is required. A heavy harrow should be used during the hot weather to grub up stubbles, scrape the surface, and fill in the cracks. When the first monsoon showers moisten the soil a span deep, the plough should be used and after it the harrow. The preparatory tillage should be completed as expeditiously as possible because in Broach as in all districts, except the Karnâtak, it is most important to get cotton sown early. Two ploughings and two or more harrowings may be required before the seed is sown, and usually also it is necessary to use the *samâr* (plank roller) to level the surface. Sowing should, if possible, be completed in June.

When cotton is sown alone, the seed is drilled in rows 22″ to 26″ apart.

Preparing the seed for sowing and sowing the seed.

The seeds, although carefully ginned, retain some lint and fuzz; therefore, they cling together, and in consequence, require special preparation for sowing. The seed is prepared for sowing by

mixing it with a thin plaster of cowdung, mud and water, and rubbing the plastered seed on the close network of a *chárpái* (native bedstead). This treatment makes it possible to pass the seed when dry ready through the seed bowl and tubes of an ordinary country seed drill. The bamboo tubes are larger in diameter for cotton than for ordinary grain crops. The seed rate varies. 5 lbs. per acre would be ample if all the seed germinated and was equally distributed; but, as the seed is cheap, three times the above quantity is usually sown. Two harrows follow one drill to cover the seed and smooth the surface. When young, the seedlings are very delicate and liable to damage by insects and also by heavy rain. If the seedlings are damaged to a considerable extent before they produce true leaves, the crop should be re-sown, especially if the season has not far advanced.

Interculture and thinning out the plants.

The crop is generally intercultured with the bullock hoe and hand weeded once or twice. Interculture begins when the seedlings are about 4 inches high. When they have made some further progress, the weaklings are thinned out. The plants are left about 18 inches to 2 feet apart in the rows, but this only in the case of a field in good condition and in an early sown, promising crop. If the young plants are backward, and stunted from any cause, they are left much closer together. Cotton must be kept quite free from weeds, or it will not thrive. The plough is passed between the rows in September or October. This is the final tillage operation. It has the effect of preventing deep black soil from cracking and therefore has also a tendency to conserve the moisture in the soil. Interculture of any kind would do harm when the flowers appear, because it would interfere with proper fertilization.

Rice subordinate to cotton.

It is a common practice in the very deep black soil of Broach to grow cotton and rice mixed. The practice is unknown in any other part of the Presidency. This practice safeguards the Broach cultivator. Cotton seedlings are liable more or less to be damaged and destroyed by heavy downpours of rain early in the season on retentive deep black soil. Rice usually flourishes in such rainfall. The rice generally occupies the same rows as the cotton, and when alone occupies an intermediate row. The cotton rows are generally 28 inches apart, but if the field has recently been manured and is therefore in good condition, the distance may be as much as 3 feet. With a heavy rainfall the rice does better than the cotton. With a light or moderate rainfall the cotton does best. It is seldom that the season suits both crops. The rice is ready for harvest in October. An average outturn of rice subordinate to cotton in a good field will range from 240 lbs. to 320 lbs. per acre of grain. If, when the rice is reaped, there is a good deal of moisture left in the soil, the cotton plants branch out vigorously, and if the field is in good condition, and if tillage operations (especially weeding) have been properly attended to, then a good cotton crop may be expected.

The flowering period.

Broach cotton begins to produce flowers in October-November, and the outturn is considerably affected by the character of the weather during the flowering period. This period in a season of favourable late rain lasts until January. A few flowers appear even later. Cloudy weather during this period is disastrous, sometimes in causing imperfect fertilization or at least in causing immature bolls to fall from the plants in large numbers.

Harvest.

Cotton picking usually begins in January, and lasts until March and sometimes to April. The crop is picked at short intervals, because the cultivators fear that their fields will be robbed at night. Four or five pickings are necessary when there is no risk of night pilfering. The second and third pickings are usually the most important ones. The lint can be picked clean in the early morning owing to the effect of dew on the foliage. Later in the day the mature stipules and leaves get dry and crisp owing to the heat of the sun, and stick to the lint. Therefore, picking ought always to be done in the morning. But, generally, the work is carried on throughout the day. It is done by women and children. They work more deftly than men. Contract rates are usually paid, *viz.*, 2½ annas to 4 annas per maund of 38½ lbs.—the cheaper rate for a good crop. These rates only apply to the more important pickings. The minor pickings are usually accomplished by the cultivator himself and his family.

Outturn, Broach District.

In 1898 I took several tests on what I considered average crops of cotton on well cultivated fields, the soil in each case being superior black cotton soil. In each field rice was subordinate to the cotton, but was not tested. The outturn of rice may fairly be estimated as worth Rs. 7 to Rs. 10 per acre.

The cotton outturn results worked out as under:—

Field.	Local Anna Estimate of Crop. (Full Crop 16 Annas.)	Outturn of Seed Cotton per acre.	Value of Outturn.	Assessment per acre.
		Lbs.	Rs. a. p.	Rs. a. p.
1st	14	446	30 9 8	5 7 0
2nd	14	400	27 7 2	5 6 10
3rd	12	378	25 15 0	5 10 0
4th	10 or 11	334	22 14 9	5 2 11

Marketing the produce.

It is the invariable practice in the Broach District and in most cotton growing districts to sell the seed cotton produce (lint and seed) to the owners of ginning factories. It is sold by the *bhár* of 24 maunds of 38½ lbs. The *bhár* is, however, a variable weight in different tálukas. A *bhár* of the weight referred to was, in 1898, worth Rs. 75 to Rs. 85, but is variable in value in different seasons and for different qualities. Cotton picked in dirty condition commands a smaller price than clean cotton. Again, if the lint is seriously discoloured and damaged by boll worm, as it too commonly is, a poorer price is obtained.

Broach and other Bombay varieties. Professor Middleton's descriptions.

The *Deshi* or *Kánhami* cotton of Broach as cultivated in Broach and Surat is a pure, unmixed variety, and is probably the best long stapled cotton in cultivation in India. Another variety—*goghári*—is in general cultivation in Broach, but, although occasionally grown from pure seed, is usually mixed with *Deshi*. *Goghári* cotton is gaining ground, because it is hardy, vigorous growing and safe to yield a good outturn in an ordinary season. It gives a high percentage of lint to seed. The lint is whiter than *Deshi*, but is shorter and coarser. The reader is referred for full descriptions of these and other Indian cultivated cottons to Professor Middleton's

excellent note printed in Agricultural Ledger No. 8, 1895. He describes all the Bombay varieties, and gives sound advice regarding possible methods of improvement.

Improvement by selection of seed.

The two varieties of cotton referred to suit the conditions of soil and climate in Broach and Surat, and their maintenance as pure varieties is important. Their improvement by selection of seed continued from year to year is still more important. If careful selection of seed is practised, and if the cultivator takes the trouble to hand gin his seed at home (as is done in Khándesh), there is hope that the lint will be improved in quality, that the outturn per acre will increase, and that boll worm which now does such extensive damage in the cotton fields of Broach and Surat will do less harm. In specially selecting the seed, cotton should be picked from the best sound bolls of large, healthy plants of branching habit of growth, each plant having a large number of bolls. Seed should not be taken from plants on which any of the bolls are affected with boll worm. Such bolls can easily be detected on account of the stained colour of the lint. If seed affected with boll worm is used, there is grave risk of the crop grown therefrom being affected. It is well known that boll worm exists from season to season, the larvæ feeding by preference on the kernels of cotton seed. As a further precaution against boll worm attack, cotton seed should, before it is prepared for sowing, be steeped for five minutes in a ½ per cent. solution of copper sulphate, and afterwards dried in the sun. The Broach and Surat cultivators get their seed under existing conditions almost entirely from the ginning factories, and it is easy to conceive that impure seed tainted with boll worm larvæ may thus be obtained.

Cultivation in Surat.

The cultivation in Surat does not differ materially from that in Broach. The same *Deshi* variety is the principal crop in both districts.

The general conditions of soil and climate and rotation practised.

In Surat, cotton is confined to the northern tálukas having a moderate rainfall. The average rainfall is perhaps slightly heavier than in Broach. But Surat cotton soil is not so deep or so dense, and, except in low-lying water logged situations, there is less risk of cotton seedlings being destroyed by heavy rain. The rotation crops with cotton are in Surat mostly *kharif* crops, whereas in Broach they are *rabi*. *Jowári* is the principal rotation crop, and it has always a subordinate mixture of white *tuver*. Here and there the rotation is extended by taking sesamum or mixed sesamum and *tuver* and in one táluka wheat. Rice is never sown with cotton in Surat. If there are vacancies in cotton fields due to irregular germination, such are generally sown with sesamum.

Tillage.

Cotton follows *jowár* usually. The *jowár* stubble which is generally of considerable length is removed in the fair season and used as fuel. The harrow is generally used once or twice before the rains. The field is ploughed once after the first fall of rain, and further worked with the harrow once or twice. About 15 lbs. seed per acre is drilled in rows 18 to 24 inches apart. Two harrows

follow one drill to cover the seed and smooth the surface. The crop is intercultured two to four times with the bullock hoe and hand weeded once or twice. The plough is passed between the rows in September or October.

Average outturn.

I do not think that on an average the cotton crop of Surat yields so well as in Broach. Seventeen special crop experiments taken in the Surat District in 1895-96 give the following averages :—

Seed rate per acre.	Outturn, Lint and Seed per acre.	Value of Outturn per acre.	Assessment per acre.
Lbs.	Lbs.	Rs. a. p.	Rs. a. p.
15	361½	31 5 3	5 4 4

A comparison with crop test results from Broach will show that the price of cotton depreciated considerably between 1895-96 and 1897-98.

Cultivation in the Karna'tak.

The general character of soil, climate and tillage.

The cotton lands of the Karnátak, especially in Dhárwár and Belgaum, are subject to the influence of two monsoons—the South-West between June and October and the North-East or Madras monsoon between October and December. It is essential that the cotton crop should be sown at a time which will bring it to maturity when rain is not expected. The Dhárwár varieties, if sown in June as in other districts, would ripen in the middle of the North-East monsoon, and the lint would be seriously damaged by rain. As a rule, cotton sowing begins in August, generally in the latter part of the month. It may extend to September. In ordinary seasons the rainfall before August will have thoroughly soaked the soil, and have given the cultivator full opportunities for giving the necessary tillage. Fields which are infested with deep rooted grasses like *kunda* or *hariáli* are ploughed with the heavy plough in the hot weather. The land is turned up into huge clods. In badly infested fields the patches of *kunda* may be hand dug. This is a tedious and costly operation. The clods crumble after the first fall of rain. Then a heavy bladed harrow is used, and tillage by means of this implement is continued during June and July. Fields which are fairly clean are ploughed with a light plough after the rains begin and not before. They are afterwards worked at intervals with the harrow to keep down weeds and to prepare a satisfactory seed bed. At sowing time the soil should be dry on the surface, but moist below, and smooth and friable to a depth of about 3 inches. The seed is drilled in rows which are 18" apart. The seedlings are not thinned out to the same extent as in Broach and Surat. They are left comparatively close together in the rows, and in Dhárwár fields, as ordinarily cultivated, the plants are puny as compared with those in the best fields of Broach. The Dhárwár crop is intercultured and hand weeded as carefully as in Broach, and the description given for Broach applies to the Karnátak, but chiefly to Dhárwár.

Varieties.

Two varieties are in common cultivation—the indigenous variety commonly known as *kumpta* (presumably because exported from that seaport before railway communication was introduced) and acclimatized American, commonly known

as "Saw-ginned Dhárwár." The indigenous *kumpta* closely resembles Broach *Deshi*, and produces lint of fine quality.

Exotic varieties.

The exotic was introduced by Government in 1842, and in the Karnátak its cultivation rapidly extended, and has been more or less maintained. In all other districts of the Presidency exotic cottons have failed to take any prominent established place amongst the cultivated varieties. Even in Dhárwár the cultivation of the exotic is declining and that of *kumpta* extending. Dhárwár and Belgaum enjoy a more or less unique climate, and it is this circumstance more than any other which has enabled there the successful acclimatization of New Orleans cotton. As regards other cotton districts with ordinary climates, it has, I think, been demonstrated with certainty many years ago that exotic varieties are unsuited to the ordinary agricultural conditions. Further than this, it may be confidently stated that even an indigenous variety found suitable in one district might prove unsuitable for another. The only hope of improvement lies in taking the varieties in general cultivation as we find them, and making efforts to improve them by selection of seed continued from year to year.

In Dhárwár the American variety begins to flower in December, generally a fortnight before the local variety. The crop is picked between February and March.

In ordinary season there is not much difference in outturn between varieties; 100 lbs. lint of about 300 lbs. seed cotton may be taken as average outturn.

Khá'ndesh Cotton.

Efforts to improve Khándesh cotton failed for reasons given.

The variety of cotton in general cultivation is known as *varádi* or *nimári*. This is a short stapled cotton with coarse fibre. The lint, however, is very white in colour, and is for this reason suitable for mixing with other cottons of inferior colour. The plant is hardy, and in ordinary seasons with ordinary cultivation yields a fair outturn. Efforts to improve the cotton of Khándesh were begun in 1831, and were continued with great perseverance for many years. At one time the *varádi* was, to a large extent, supplanted by foreign varieties yielding long stapled cotton of fine quality. The history of cotton improvement in Khándesh is well told in the Gazetteer of the District. The results, if epitomized, may be stated as follows: that exotics were found difficult to acclimatize, that when acclimatized they degenerated, they yielded well when acclimatized in favourable seasons and with careful cultivation on particular kinds of soils, but in unfavourable seasons they were either seriously injured or irretrievably damaged. On the other hand, it may be claimed for the local variety that its cultivation is attended with less risk, that it suits the various descriptions of soils of the district, and is not seriously affected by too much or too little rain or other ordinary unfavourable conditions of climate. The natural consequence is that *varádi* is now grown over nearly the whole Khándesh cotton area, and its cultivation will continue until the Khándesh cultivator finds a superior variety which can be grown without risk, and which he is also convinced can be grown with greater profit.

Khándesh cultivation of *varádi* cotton.

The crop is grown on black as well as on light soil, and generally occupies the same field once in three years. In the other years *jowári*, wheat, gram or linseed may be grown on black soil, and *jowár*, *bájri*, sesamum, etc., on the light. The light soil crop yields best in years of heavy rainfall. The black soil crop is best with moderate rainfall. Manure is generally given to the crop taken before cotton. A good cultivator prepares the land for cotton carefully. The field gets similar preparatory tillage to that described for other districts. The seed should, if possible, be sown in June. A two coultered drill is used. The rows are about 18″ apart. The seed rate is 10 to 12 lbs. per acre. The seed is prepared for sowing as in other districts, but is not sown through the seed bowl and tubes of the drill itself, but through two separate tubes fastened by ropes one behind each coulter and each guided by a woman along the track or furrow made by the coulter. The bullocks are driven by a man. The women follow about 1½ yards behind the drill, and pour the seed through the bamboo tubes. The crop is hand weeded once and bullock hoed twice or oftener as required, the first time when the seedling are 4 inches high. Cotton picking begins in October, and generally is complete in December. Three pickings at least are necessary. A good ordinary crop will yield 350 lbs. seed cotton per acre.

Cost of Cultivation, Surat District.

	Per acre. Rs.	a.	p.
April—Twice harrowed in hot weather	0	14	0
Collecting and burning stubble of previous crop	0	4	0
May—Manuring—12 loads manure	6	0	0
June—Twice ploughing with light plough	2	2	0
Digging corners and head lands	0	3	0
Twice harrowing	0	8	0
Sowings by drill and covering seed	0	9	0
Cost of seed 15 lbs.	0	4	0
Bullock hoeing	0	4	0
July-Aug.—Hand weeding and thinning out plants	1	10	0
Bullock hoeing second time	0	3	0
Sept.-Oct.—Ploughing between rows	0	8	0
Picking cotton crop 440 lbs. seed cotton	2	8	0
	15	13	0
Add—Assessment	6	0	0
Rs.	21	13	0

BOMBAY HEMP—*Crotalaria juncia*—Linn.

Natural Order—*Leguminosæ*.

Sub-order—*Papilionaceæ*.

Tribe—*Genisteæ*.

Gujaráti, *San*; Maráthi, *Tág*, *San*; Kánarese, *Sanbu*.

Habitat.

Some authorities believe that the plant is found in a wild state throughout India. Others believe that the so-called wild plants are escapes from cultivation. The origin of the plant is doubtful. It is everywhere cultivated in the plains in India.

General character of the plant.

San is grown for two particular purposes in Bombay—(1) as a green manure crop, (2) as a fibre plant. In each case the seed is thickly sown, and the plants grow unnaturally tall with very few branches except near the top. A good crop for fibre grows to a height of 6 to 8 feet. The yellow flowers grow in racemes. The pods are oblong, full bodied, and contain numerous kidney shaped, slate coloured seeds.

Distribution.

The total Bombay area is less than 30,000 acres annually. The crop is sparingly grown in all districts, the most important centres of cultivation being Ahmedabad, Panch Maháls, Surat, Khándesh, Násik, Sátára, Belgaum, Thána and Ratnágiri. In these districts the annual areas range from 2,000 to 4,000 acres.

Season.

San is usually sown during the rains. In the Thána District it is grown near the coast as a *rabi* crop in moist fields after early rice and chiefly on account of the value of the fibre to fishermen for their nets.

Soils.

The crop grows best in moderately retentive deep soils, such as are sutiable for irrigated crops. As a green manure crop it is grown on all descriptions of *garden* land, also in rice beds.

Rotations and mixtures.

San as a green manure crop may be grown subordinate to *surans* and some other garden crops, and uprooted, broken up by hand, and put on the surface of the soil when 2 to 2½ months old. Usually, however, it is grown alone, and ploughed in as a green manure as a preparation for rice, sugarcane, and other irrigated crops. As a fibre crop it is always grown alone. It is rotated in no definite way with other crops, being grown mostly as a catch crop when favourable opportunities occur.

The special advantages of *san* as a green manure crop.

The seed is sown thickly; the seedlings on suitable soil and under favourable conditions grow very vigorously. A thick mass of vegetation is soon produced. This smothers all weeds. The crop should be ploughed in when 2½ months old. The tissues are then soft and cellular, and a large amount of organic matter which quickly decays is added to the soil. *San*, like other leguminose crops, increases the store of combined nitrogen in the soil. It is probably the best green manure crop known.

Cultivation.

A luxuriant crop cannot be grown without careful tillage. Quick growth is necessary for successful results, whether the crop is grown for fibre or green manure. A smooth friable seed bed is, therefore, required, and this can only be obtained by ploughing and repeated harrowings. The seed is generally drilled in July; in the Deccan with a four-coultered drill, first lengthwise, then across the field. The drill coulters are 12″ to 14″ apart, and the double drilling secures even distribution of the necessary heavy seed rate (about 70 lbs. per acre). If the seed germinates properly, no further culture is required until the crop is ploughed in as green manure or reaped

for fibre. In the former case the plants are allowed to grow to a height of 2½ to 3½ feet. A long fairly heavy log of wood should now be drawn horizontally over the crop to level it. A country plough should then be worked. Women following the plough should place the levelled stalks by hand as far as possible in the furrow, so that the soil moved by the plough in making the next furrow covers them. The field should now be left undisturbed until the *san* has decayed to a considerable extent; then the tillage necessary for the succeeding crop may be started.

The fibre crop.

The preliminary tillage, seed rate and method of sowing is the same as for the green manure crop. If the seedlings come up somewhat crowded, they should be sparingly thinned out to leave a clear space of at least 2″ between plants in the rows. The crop should be allowed to grow almost or quite to maturity. This takes about 4½ months. The fibres or fibro-vascular system develope fully as the crop matures. The finest, strongest and best fibre may possibly be got from plants which are not dead ripe, but very good fibre as well as seed are got from a ripe crop. The stalks are harvested by uprooting and are left exposed to the sun for a few days, and then are tied into neat bundles, easily handled. Each bundle contains about 100 stalks. The bundles should be stooked up and thoroughly dried for two or three weeks. The leaves and seed vessels are easily removed by light beating.

Process of extracting the fibre.

The threshed bundles are tied, about fifty together, in a big bundle. These bundles weighted by stones are steeped horizontally in water. The fibre is extracted easiest in the hot weather. The beat of the atmosphere and of the water hastens fermentation, so that the fibre readily separates. *San* should be steeped for five days. The bark with fibre is then readily separated by hand from the root end upwards. About 2 lbs. of these strips are beaten with a stick on a stone for about two minutes. The strips are then threshed in the water of a stream or tank until long clean fibre is seen separate. The half cleaned fibre is again beaten with a stick on a stone and again threshed in the water. The whole beating and threshing process takes about fifteen minutes. The hank of fibre is now made into a twisted bundle, and these twisted bundles are kept in a heap for two or three days and then opened out, and hung over a rope in the sun for three days to dry and bleach. The fibre is now made into a three ply plat like a Chinaman's pig tail and is ready for market.

Value and economic uses.

It is worth, when clean, long and good, about 5 lbs. per rupee, and is sometimes dearer. It is used for twine, bags, ropes, etc.

Outturn.

The following outturn results were obtained in 1898 from a moderately good crop at the Poona Government Farm :—

Dry Ripe Stalks, Leaves and Seed removed. Per acre.	Fibre Per acre.	Percentage, Fibre to Dry Stalk.
Lbs.	Lbs.	
6,280	520	8·2

The fibre crop, like the green manure crop, is excellent for rotation. The roots extend well into the subsoil, and this great range enables the plant to collect plant food through a large bulk of soil. The leaves fall as the crop ripens, and litter the surface soil with a top dressing which serves to manure the succeeding crop. A large stock of assimilated nitrogen is left by the roots in the soil.

The value of the fibre crop in rotation.

DECCAN HEMP OR AMBA'DI—*Hibiscus cannabinus*—Linn.

Natural Order—*Malvaceæ*.

Tribe—*Hibisceæ*.

Vern., *Sheria*, Gujaráti; *Ambádi*, Maráthi; *Pundi*, Kánarese.

Watt says: "A small herbaceous shrub, apparently wild East of the Northern Ghâts." It is largely cultivated for its fibre throughout India, but more extensively in the Central Provinces, Madras and Bombay than in Northern India.

Habitat.

Ambádi is an annual. It is grown in Bombay subordinate to other crops, and the natural tendency of the plant to branch freely is checked to some extent. The plant grows under favourable conditions to a height of 3½ to 4½ feet. The leaves are alternate with long petioles, the lower stem leaves being entire or serrated, ovate cordate, whilst the upper ones are deeply lobed with three to five divisions. The lobes are narrow, sharp pointed, and serrated. The flowers are large, bright yellow, with purple red centres. The fruit is a capsule, rounded, enclosed in calyx. The stems, petioles of leaves and the fruit are prickly, and the plant is not easy to handle. The seeds are of three cornered peculiar shape, very dark grey, nearly black, with faint small numerous spots of lighter colour.

General character of the plant.

Ambádi is cultivated all over India in the plains. The Bombay statistical returns show an area of about 90,000 acres annually. It is an important crop in all districts, but is most important in the Deccan and Karnátak. The crop is grown as a mere sprinkling among other crops, and the actual area in which the crop is grown is very large indeed.

Distribution.

There is a sprinkling of *ambádi* in almost every *bájri* field in the Deccan and in Northern Gujarát. It is also grown subordinate to *jowár*, not so much in pure black soil as in soils of lighter description. It grows best on the alluvial soils of Northern Gujarát, but does very well in medium black soils in the Deccan. It is always a rain crop, and is rarely grown alone.

Mixtures; soils; season.

The tillage is the same as that of the crop with which it is associated, and the cultivation has, therefore, been already described under the head *bájri*. The plants ripen in October-November, and should be uprooted, then dried in the sun for a few days and tied into small bundles containing 35 to 40 stalks.

Cultivation.

The leaves and capsules are separated by beating the bundles smartly on a log or board after they are thoroughly dry. The seed is separated from the capsules by beating with a stick and cleaned by winnowing in the usual way.

Extracting the fibre.

The small dry bundles of *ambádi* are tied, like *san*, into large bundles. These in the hot weather are steeped in water and weighted down with stones for ten days. *Ambádi* requires to be steeped longer than *san*. When removed, the bark and fibre should readily peel off from the root upwards, and is cleaned and prepared for market in precisely the same way as already described for *san*.

If the fibre is separated in the cold weather, longer steeping is required, and entire fibre from the root to the top of the stems is not obtained. The strips or ribbons break off irregularly about the middle of the stems.

Value and economic uses of the fibre.

The fibre is worth about 8 lbs. per rupee. It is largely used by cultivators for their home requirements, such as well and cart ropes, plough draft ropes, halters for cattle, etc.

Outturn.

In 1898 a crop grown alone at the Poona Farm in good mixed black soil in a favourable season gave the following outturn results :—

Dry stalks stripped of leaves and fruit.	Fibre.	Percentage, fibre to clean dry stalks.
Per acre.	Per acre.	
Lbs.	Lbs.	
5,733	973	17

LUCERNE OR *ALFALFA*—*Medicago sativa*—Linn.

Habitat.

There is no vernacular name, except corruptions of the English name or to signify that the plant is English or foreign. De Candolle says that lucerne has been found wild with every appearance of an indigenous plant in several provinces of Anatoba in the South of the Caucasus, in several parts of Persia, in Afghanistan, in Beluchistan and in Kashmir. He thinks it curious that lucerne has no Sanskrit name.

General distribution in India and Bombay.

Lucerne has been grown in India for at least 100 years, but its cultivation has certainly not been ancient. The chief cultivation is believed to have originated near military cantonments and rearing and remount depôts. The area is fairly extensive in parts of the Bombay Presidency, especially near Poona and Ahmednagar.

Habit of growth.

Lucerne is of the clover genus. It has trifoliolate leaves, and papillionaceous flowers of a purple colour. The fruit is a legume or pod, twisted in a peculiar spiral manner, and contains six or eight seeds which are small, kidney shaped, and yellow to brown in colour. The plant is a perennial, and under favourable conditions thrives for four years or longer. When well established, many shoots spring from one root. Lucerne, like many forage

plants of the same natural order, sends its long tap roots deep into favourable subsoils, particularly those of a calcarious character. It grows to the height of about 2½ feet, and on suitable, well manured soil will produce, after being cut, a full crop in six weeks. It grows most vigorously during the rains, much less so in the hot weather.

Resists drought in temperate countries, but gives its best results under irrigation in hot countries.

Soil suitable or unsuitable.

It is recognized as one of the most valuable of fodder plants, resisting drought in an extraordinary way in those countries where it is grown without artificial watering. It shows its best results under irrigation on deep friable loam soils, with a limestone subsoil, and with a liberal application of suitable manure. It does not do well on black or heavy soil, because such land is unsuitable for irrigation. It does fairly well on light sandy loam.

More suitable as fodder for horses than for cattle.

Lucerne generally commands a high price (about 100 lbs. per rupee), and generally forms part of the daily ration of horses in hard condition. To milk cattle it can only be sparingly fed. 10 lbs.—the daily allowance for a horse—is also the maximum quantity that can be fed to a cow. Its tendency to cause tympanites is the danger to be guarded against in feeding it to ruminants.

Varieties.

There are at least two varieties of lucerne cultivated in India. The Persian or Arabian variety is that ordinarily grown. The Kandáhár lucerne is sparingly grown, but is not a variety to be recommended. The stems have a trailing habit of growth, the leaves are small, and each time the crop is irrigated, the lower branches are submerged, and thereby the leaves get yellow and fall off. The Arabian lucerne is much more upright and vigorous in its habit of growth.

Price of lucerne seed. Method of determining as to soundness and vitality.

Lucerne seed is dear. The price ranges from As. 14 to Re. 1-8 per pound. Its soundness can, to a certain extent, be judged off by sight. If it is plump and glossy, and the seeds are mostly rich brown in colour, it is probably good. But it is safest to test the germinating power of the seed before sowing. This can be conveniently done by noting the percentage of seeds which strike when kept in moist flannel in a warm place for two or three days.

The best time for sowing.

The best time of sowing in the Poona District is either early in the rains or between October and December. If sown at any other season, it is apt to be attacked by aphides (green fly) or eaten by caterpillars whilst the seedlings are young; or, if sown in the hot season, the young tender seedlings are scorched by hot winds. The best time for sowing in the North of India (where the crop does exceptionally well) is from the middle of October to the middle of November.

Native methods of sowing and of irrigating.

The usual native method of sowing is to broadcast the seed on a clean, well prepared bed about 10 feet square. 16 to 20 lbs. of seed per acre is required. The seed is lightly covered with soil by means of a wooden rake. A through water gutter generally runs between each double line

of beds, but the arrangement of the water channels is regulated by the evenness or otherwise of the field surface. Water is given every ten days in the cold weather or during breaks in the monsoon, every six to eight days in the hot season according to the character of the soil. The water is directed from the water channels into each bed in turn. Lucerne planted in this manner will yield heavy cuts for two or three years. Meantime, the field gets foul by deep rooted grasses and other weeds which the cultivator is powerless to suppress, and on this account the lucerne fails when it ought to be in full vigour. In this respect the country method resembles lucerne cultivation in England, where it is grown in rows about 12 inches apart. The crop gets smothered after two or three years with twitch grass and other weeds in spite of periodic horse hoeing.

Disadvantages of native method of cultivation.

It is important that the crop when once established should last, because the initial cost of laying it down and subsequent outlay in manures are alike heavy.

Initial cost of cultivation heavy.

The following is a better method of growing lucerne than the country plan. The field should be well ploughed and brought into a thoroughly friable, smooth, clean condition during the rains. In September a liberal dressing of thirty loads per acre or more of thoroughly decayed farmyard manure should be given. Half rotten manure does not answer well, because it keeps the soil open. It does not supply the needs of the young seedlings at once, and white ants are attracted to the field. The manure should be evenly spread, and by subsequent ploughing and harrowing mixed thoroughly with the soil. Ridges are then formed. The seed is sown on the ridges which can be made 22 to 28 inches apart by an ordinary native plough. In practice it is found necessary to fashion the ridges afterwards into neat proportions with the hand hoe. The slope of the surface of a field will indicate the direction in which the ridges should be drawn. Irrigation water must slowly flow along each furrow. If the inclination of a furrow is too great, soil and manure are swept to the lower level of the field by the water getting too much velocity. The crop is, moreover, unequally watered, that on the lower portions of the field getting too much water, while that on the higher portion gets too little.

A good method of cultivation.

Manure.

Preparation of the soil and ridging.

Proper arrangement of furrows for irrigation.

A rather deep groove is made along the top of each ridge with a light hoe. The seed is best sown by hand. It should be carefully sown and carefully covered by not more than 1½ inches of soil. The whole operation rounds and flattens the ridges, and permits the seedlings to spring up in lines, covering a width of 3 or 4 inches. Crowding of the seedlings in dense rows is thus avoided. The importance of fine tilth is obvious, because the seed is small, and the seedlings very delicate until they take a firm hold of the soil. Frequent waterings are required during the first fortnight. The seedlings would probably wither, if exposed on the top of a ridge to a hot wind unless sufficient moisture is within reach. This method of sowing effects a saving of seed. 10 lbs. per acre is ample.

Sowing and seed rate.

The advantages of the "ridge and furrow" system of cultivation.

One object of sowing lucerne on ridges is to raise the stems of the plants out of contact with irrigation water. Under natural conditions the plant requires very little surface moisture. Its great root development enables it to collect enough in the subsoil, and therefore, when water floods the crop as well as the soil, as in the ordinary bed system, unhealthy conditions are induced, particularly in low lying places. If the plants become submerged in water, and are afterwards exposed to the sun, they turn yellow and unthrifty. On medium soil, lucerne planted in the above manner requires water every eighth day in the cold season, every sixth day in the hot weather, and oftener if the soil is light. Water should be given also during breaks in the monsoon.

Weeding by means of Planet Jr. hoe.

The principal object aimed at in adopting the ridge and furrow system is to keep the field clean. The furrows can be weeded each time the crop is cut by using an ordinary bullock hoe or scuffler. I have found the American Planet Jr. hoe—which with extra parts costs Rs. 33 in Bombay—the best possible implement for the purpose. It is easily worked by a pair of bullocks, and can be drawn by a rope or chain attached to an ordinary neck yoke. If fitted with grubber tires in front, and an earthing up double mould board behind, it grubs up the weeds, and earths up the ridges at one operation. It can be adjusted to any ordinary width of furrow over 18 inches. If manure is applied at every second or third cutting as it ought to be, it can by means of this hoe be incorporated with the soil and placed directly in contact with the roots of the crop. Moreover, the furrows are left clean, so that water can flow properly. Lucerne requires liberal top-dressings of manure at short intervals. There is nothing better than well rotted farmyard manure. At least five tons should be applied every third time the crop is cut. (It should be cut as soon as it comes in flower.) If farmyard manure is not available, castor cake, 3 to 4 cwts. per acre, is a good substitute. With the above treatment a crop will be well established in six months, and should last for years, yielding at least ten cuts per annum.

Top dressing and manures suitable for top dressing.

Diseases and methods of prevention.

Lucerne does better in the North of India than it does in the Deccan. In the Poona District the crop is liable to damage from disease and many mishaps. Thriving plantations have been attacked with aphides, caterpillars, and a fungoid disease. The insects swarm in such numbers that any ordinary insecticide application has little or no beneficial effect. Dusting the affected plants with ashes and lime does some good, but the best plan is to cut the whole crop, carry it to a distance, and burn it. A belief is held by native cultivators that a border of carrots round a patch of lucerne will keep away insects while the lucerne seedlings are young, and until the plants are well established. I have seen many fields almost totally destroyed by green fly in the hot season recover somewhat in the rains. Heavy continuous rain will completely destroy the pest.

Damaged by frost and by dodder.

In the North lucerne is often damaged by frost. It is everywhere liable to be attacked by dodder—a plant parasite which, on account of its bright yellow colour, is easily discernible. The host plants should be

grubbed out at once, and burnt root and branch. The pest is also found in the Poona District.

The Poona fungoid disease and a possible remedy.

The fungoid disease which is so destructive in the Poona District attacks the roots. It is most destructive in wet seasons, and is not amenable to treatment with copper sulphate solution as most fungoid diseases are. It is noteworthy that a piece of lucerne on the Poona Farm, which had become patchy through this disease, was filled up by planting guinea grass. The mixed crop corresponding to the "rye grass and clover" of England did exceptionally well for two years, the lucerne keeping quite healthy until finally grubbed up.

It may be that the losses due to disease may be avoided by growing lucerne mixed with guinea grass. Lucerne, if it remains healthy, is one of the most paying crops which can be grown. But in the Poona District there is a considerable risk of considerable loss by its cultivation.

Outturn results, Poona Government Farm.

The best results on the Poona Farm during 1892-93 and 1893-94 were as under:—

	Outturn per acre.	Value per Rupee.	Cost of Cultivation per acre.	Value of Produce per acre.	Remarks.
	Lbs.	Lbs.	Rs. a. p.	Rs. a. p.	
1892-93 ...	83,793	120	330 6 0	698 4 3	Ridge and furrow crop.
1893-94 ...	31,816	120	85 3 8	365 2 0	Do.

Lucerne does not make good hay.

Lucerne does not make good hay. Unless it is dried and handled very carefully, the leaves get so brittle that the greater proportion of them fall off, and are lost before the dry fodder can be stacked and little but dry stalks remain.

Saving lucerne seed.

If lucerne is saved for seed, this should be done about the middle of the cold weather. Water should be sparingly given and withheld as the seed ripens. The object is to prevent a too succulent growth of stems and leaves, to encourage the formation of flowers and seed-vessels, and to produce plump seed which has slowly matured.

GUINEA GRASS—*Panicum jumentorum*—Pers.

Habitat and general distribution.

Guinea grass is a native of tropical Africa, and is now cultivated in many hot countries. Watt says that "guinea grass appears to have been first cultivated in the West Indies, having been grown in Jamaica since the middle of the eighteenth century. It was recommended for cultivation in India as early as 1793 by Mr. W. Fitzmaurice."

General character of the plant.

This perennial grass grows in tufts or hussocks, many stems springing from one root. The roots are fibrous, and form a network in the soil near the surface. In countries of moderately temperate climate, such as that of the plains of Northern India, the grass remains more or

less dormant in the cold weather, but flushes up with warmth and moisture afterwards. In the hotter parts of India the grass remains green throughout the year under irrigation. It may even exist without irrigation in the fair season. Such plants as survive spring up into vigorous growth when the rains come. In the monsoon and sometimes at other seasons the grass flowers, and produces seeds freely in India. When in full flower, the stalks are 5 to 8 feet high, and the graceful branching panicles give the crop a very handsome appearance. During the greater part of the year leaves are produced rather than flower stalks. The best results are obtained with copious irrigation throughout the year and with heavy applications of manure. In the warmer parts of India guinea grass grows best in the monsoon and the early part of the cold weather. It has no dead season, but gives a decidedly poorer outturn in the fair season than in the monsoon.

Distribution in Bombay.

The area is not separately returned. It has extended within recent years, and is considerable in the vicinity of military cantonments, at the Remount and Rearing Depôt, Ahmednagar, near Karáchi, and in other parts of Sind, and in Native States, and particularly in Gujarát and Káthiáwár. The cultivation has chiefly extended from Government Farms.

Propagation.

Guinea grass may either be propagated from the true seed or by sub-division of the root stock. The latter is the preferable plan. The hussocks become overgrown in a two or three year old crop, and the plantation is improved if each root stock is diminished in size all round. This can be done by means of a spade or native pick; the portions removed will furnish sets for planting a new area.

Soils.

Guinea grass, like lucerne, does best on deep medium loam which can be irrigated to advantage. It also does well in light deep sandy soil, such as the *goráḍu* soils of Kaira and Ahmedabad, or the alluvial sands of Sind.

Cultivation.

The soil should be friable to a considerable depth, and such tilth can only be obtained by repeated ploughings and harrowings. Thirty cart-loads or more per acre of thoroughly decayed farmyard manure should be given and freely mixed during preparatory tillage with the soil. Each set should consist of four to eight stalks, each well rooted. Each set should be carefully planted 20 to 24 inches apart in each direction. The rows should be accurately straight both lengthwise and across the field. The sets should, in the first instance, be planted on the flat, and, if possible, during the rains. At any other season, in order to induce quick growth and non-failure of sets, the field should be swamped with irrigation water immediately after planting. If there is a fair slope in any direction, the irrigation water can easily be led over the whole field. The sets can be planted during the monsoon advantageously on moderately light land, when light rain is falling or immediately before rain, and on heavier soil soon after rain.

Ridging and watering.

When the crop has become established, the rows should be ridged up in the same manner as for lucerne and in the direction of the least slope of the field, so that the irrigation water, when applied, may run slowly along the furrows. Subsequently, guinea grass can hardly get too much water or manure. The water must not, however, stagnate.

The hussocks get overgrown in about two years, and it pays to grub up a plantation which has been established about three years. The ground need not necessarily be changed. New sets should, in the first instance, be chopped off from the old hussocks, and planted in the furrows at the required distance apart, and, when established, the old plantation can be grubbed up. If this plan is adopted, the new plantation is almost in full vigour before the old plantation need be removed.

Plantation should be renewed in three years.

It is important that guinea grass should be kept clean, and if the sets are planted straight, both lengthwise and across the field, this can easily be managed. A country bullock hoe or country plough can be worked in any direction, and weeds which are not removed by these implements should be removed by the weeding hook (*khurpa*). Guinea grass requires to be watered and manured as regularly as lucerne, but the former probably requires more manure than the latter to produce the best results. There is no better manure than well rotted farmyard manure, and it should be applied in dressings of at least five tons per acre every fourth time the crop is cut.

Weeding.

Top dressing.

If guinea grass is propagated by seed, the seed should be thinly broadcasted in a well prepared seed bed. When the seedlings are well grown and have each produced three or four shoots, they should be transplanted into rows in the manner already described for sets.

Propagation from true seed.

Guinea grass is almost exempt from disease of any sort. Smut sometimes appears; but as it attacks the seed, it does no great harm, because the crop is generally, and should be, cut as fodder before the flowers and seeds are produced.

Diseases.

When the flower stalks appear, the herbage is coarse and fibrous, and not nearly so suitable as food for horses and cattle as at an earlier stage. In cutting a crop care should be taken that the hussocks are reaped as close to the crown of the roots as possible, because subsequently the stubble which is otherwise left, and which sometimes stands 9 inches to a foot high, prevents the green succulent shoots being cut so near to root stock as is advisable, and, therefore, considerable loss occurs.

Fodder coarse when the flower stalks appear.

Reaping.

The crop provides an exceptionally fine fodder for all descriptions of farm animals, and can be fed without any waste to highly fed animals. Perhaps, its most valuable characteristic is that it grows well under the shade of trees where no other fodder crop or grass will thrive well. It does well in damp situations, if water does not positively stagnate there. Moreover, it has the decided advantage of growing well continuously on the same land without rotation. It is believed that guinea grass is as suitable a food for horses in hard work as lucerne is, and for young horse stock and dairy cattle it cannot be surpassed.

The advantages of the crop.

Suitable green fodder for horses and cattle.

At the Remount Farm, Ahmednagar, the young horse stock are regularly fed with it. The daily ration increases with age, 25 lbs. chaffed with dry food being the maximum daily allowance. For daily cattle it can be fed up to 40 lbs. per day with every advantage.

Can be ensiled or made into hay.

It can either be ensiled or made into good hay. As regards conversion into hay, it has this advantage over ordinary grass that it grows during the fair season, and is then in the primest condition for hay-making, and can be made into hay without the slightest risk of being damaged by unfavourable weather. On the Saidápet Farm guinea grass was found to be excellent grazing for work cattle, also for ewes and lambs, but it appears necessary that it should not be grazed too closely.

Outturn.

The Poona and Surat Farm crops have given outturns ranging between 20,000 and 35,000 lbs. per acre according to season. The crops are cut about eight times in a year.

TOBACCO.

Natural Order—*Solanacæ.*

Genus—*Nicotiana.*

Gujaráti, *Tamákhu*, Maráthi, *Tambákhu*; Kánarese, *Hogesoppu.*

Habitat.

The genus *nicotiana* which reduces the various forms of commercial tobacco contains about fifty species, and all, with two Australian exceptions, are natives of America. Five or six species are cultivated, but of these only two are found in India, *viz.*, *N. tabaccum*, Linn., and *N. rustica*, Linn. The former is a common tobacco of India, and, as its name indicates, is the chief of tobacco yielding plants. It is believed to be a native of Central or South America. It is an annual plant, standing, when well grown, 4 to 5 feet in height, with large, oblong and ovate pointed leaves. The upper leaves are sessile. The lower leaves, sometimes with or sometimes without stalks, are much larger than the upper leaves. Flowers appear as terminal panicles, and vary in colour from white to pink. The fruit (a capsule) is egg-shaped, and contains numerous, very small, pale brown seeds of irregular shape.

Nicotiana tobaccum.

Nicotiana rustica.

N. rustica is cultivated in parts of Punjab, Bengal, and Assam. It is a smaller plant than *N. tabaccum*, and differs from it in several respects, the most noticeable being that the leaves are stalked, the capsules are globular, and contain oblong seeds which are larger than those of *N. tabaccum.*

Introduction into India.

Tobacco, like its allies the potato and chillies (*capsicum*), was introduced from the New World to the Old. It reached the Malabár Coast *viâ* Spain and Portugal in 1604: some authorities say at slightly earlier period. Since that time it has spread over the whole of India, and now is cultivated over an area of about 2,000,000 acres.

Distribution in the Presidency.

Belgaum and Kaira are the two chief centres of cultivation. Elsewhere the crop is only important in Sátára, Khándesh, Ahmednagar, Ahmedabad and Broach.

Soils suitable.

In Kaira and Ahmedabad, tobacco is grown in alluvial soil of great depth, which is of fine consistence, and varies in character from a sandy loam to a moderately stiff or clay loam. The Broach tobacco is grown chiefly in the bed of the Nerbada on *bhátha* land which is alluvium of sandy loam consistence, brought down by annual floods and found in the beds or shelving banks of rivers (chiefly the Nerbada). In Sátára, Ahmednagar and Khándesh tobacco is grown to some extent as a riverside crop, but also to a considerable extent on the greyish coloured soils of old village sites or as a dry crop on purely black soil. In the latter case the fields are generally close to the villages. In Belgaum the crop is extensively grown in Chikodi, to a fair extent in Athni, but sparingly in other tálukas. The crop is grown in black soil fields near villages and on riverside fields. The best tobacco is grown on the deep alluvial lands near the Krishna.

Cultivation in Gujarát.

In the Kaira District and in adjoining Baroda Territory the cultivation of tobacco is extensive. Throughout this tract, wells with salt water are very common. The water from such wells is extensively used for irrigating tobacco, and in some instances with remarkable manurial effect. Particular wells in the neighbourhood of Nadiád (Kaira District) and Petlád (Baroda Territory) contain water which is specially valuable for irrigating tobacco, and the owners derive a large income by selling to occupants of tobacco fields the right to draw water by *mot (kos)* from their wells. There is no doubt that the water of certain wells has high manurial value. At Nadiád in certain fields tobacco has been growing continuously for many years without any manure except that derived from the water of salt wells. Dr. Leather's professional enquiry regarding the composition of these well waters show that there are remarkable differences between the waters which are recognised as sweet and such as are called salt by ordinary cultivators. Wells with sweet and wells with salt water are often found in the *Charotar* villages within a stone's-throw distance of each other. The salt water in some wells is considered particularly effective for tobacco, that in others less effective. Dr. Leather concludes that the cultivator's opinion of the value of these well waters is perfectly sound. He found large amounts of nitrates in the well waters held in highest repute by the cultivators. The water from such wells is mixed in definite proportion with water from sweet wells as it is being used for irrigation. Dr. Leather calculates that the mixed water gives to a tobacco crop during the season about 500 lbs. nitrates of potash per acre. The analysis show, however, that the percentage of potash was very considerable in some waters and wholly absent in others. In some cases the nitric acid reached the crops therefore in other combinations. But as the tobacco soils are generally rich in potash, a deficiency of this ingredient in the well water could not be felt by the crop. The reader is referred to Agricultural Ledger No. 14 of 1895 for full details of Dr. Leather's enquiry.

Value of the salt wells of Gujarát for tobacco.

Soils suitable for different sorts of tobacco.

A free working, well drained soil is best for tobacco. In Gujarát on such land with sweet water for irrigation mild flavoured tobacco of good quality can be grown. But the native cultivator likes strong tobacco and a heavy crop of large coarse leaves. A crop yielding tobacco of this class grows best on medium clay loams irrigated with sweet water or with salt and sweet water combined. The *Charotar* villages of Kaira and Baroda Territory are the principal tobacco growing centres of Gujarát, and the tobacco growing soils of these villages are chiefly light coloured loams or sandy loams. Dr. Leather found that representative tobacco soils of the *Charotar* villages contained distinctly large percentages of potash, full average quantities of phosphoric acid, but the proportions of nitrogen in all are very small.

Rotation.

Tobacco is rarely rotated in Gujarát with other crops. It is claimed that the longer the soil is under the crop, the better is the produce. The soils of the *Charotar* are exceptional in being of immense depth with great natural fertility. Continuous tobacco would not be profitable on less fertile soils. Tobacco requires a full supply of nitrogen, potash, and lime, but makes no great demand on the soil for phosphates; therefore, by its continuous growth the resources of an average soil are not fully made use of. There are other objections, the principal one is that continuous growing or frequent growing encourages parasites, such as the broom rape which in Gujarát frequently does great damage in tobacco fields. There is little doubt that this plant parasite and other pests, particularly insects, would do much more harm than they do, were it not that the climate of Gujarát favours, to a particular extent, the rapid decomposition of the roots, stems and other residues of the crop which are not removed from the field. Occasionally on fields badly infested with broom rape the cultivator grows an irrigated crop of *sundhia jowár* in the hot weather. Tobacco follows in its ordinary season. The broom rape does less harm than usual, but the tobacco does not yield an average outturn.

Seed beds.

These should be prepared on elevated ground and under tree shade. The site should be selected which is likely to be affected as little as possible by heavy showers of rain. Tobacco seedlings, when young, are very delicate, and need all the protection from the sun and storm which can be arranged for. In such villages as grow a considerable area of tobacco a special piece of ground is usually set apart as a common nursery. An acre of transplantation requires a seed bed of 100 square feet at least. The seedlings before transplantation are liable to many mishaps, and some, when transplanted, fail to grow; therefore, it is well to have a sufficiently large nursery to meet such eventualities. The best plan is to have a succession of seedlings. The seed bed should be sown at intervals of a week. Seed beds 200 square feet in extent in the aggregate and sown at intervals will provide all the seedlings which will be required to plant an acre, and leave plenty to spare. The best cultivators have usually large seed beds, and sell surplus seedlings to their less skilful neighbours. Seed beds should be prepared with care. It is a good plan to *ráb* them by burning on the surface, before the rains set in, refuse, straw or hay, brushwood or cowdung. The *rábing* has greatest effect if the soil has been previously dug lightly with a light pick and the lumps broken into a comparatively

fine tilth. The burning improves the mechanical condition, the ashes manure the soil, and the heat kills weeds and insects. A *rábed* seed bed should be manured with goat manure. One cart-load is sufficient for a nursery for an acre of transplantation. The goat manure should be well mixed with the soil, and as fine a tilth as possible obtained by hand digging, etc. There is ample time to prepare the seed bed thoroughly, as the seed should not be sown until July. One ounce of fresh seed is sufficient to sow 100 square feet of seed bed. The seeds are very small, and should be mixed with a considerable proportion of fine ashes or fine sand before sowing. This secures even distribution. The seed when sown should be lightly covered with soil, and the surface pressed down. Heavy rain is disastrous, and continued dry weather is nearly as harmful. The seed beds may, therefore, need light watering by hand or protection from heavy rain. For the latter purpose, in some parts of India tatties of bamboo and straw, erected at some little height from the ground and removeable in fair weather, are used. This practice might, with advantage, be adopted in Gujarát. Weeds, as they appear, must be removed from the seed beds, and the seedlings may need thinning out. If they are too close together, they grow tall and weak, and are difficult to transplant successfully. Seedlings which are allowed sufficient room in the seed bed get their roots properly developed, and can be lifted when required for transplantation without damaging the roots materially. Caterpillars must be diligently looked for in the seed beds every morning and removed or destroyed, otherwise great damage will soon be done to the young plants.

Preparatory tillage in tobacco fields.

The stems and roots of the preceding tobacco crop should be grubbed up and burnt or otherwise disposed of as soon as possible after the leaves are harvested. Burning is the preferable method of disposal. If left in the ground, the crop residues retain a certain amount of vitality, and those of the crops which have been irrigated owing to the effect of soil moisture send forth shoots which grow to a certain extent. Even in the case of dry crops there is the same tendency. This growth has no material value. On the contrary, plants which are kept alive after harvest, help to perpetuate broom rape or other diseases. In Gujarát, as in other districts of the Presidency, the stems and roots of tobacco are usually left undisturbed during the fair season, and this practice cannot too severely be condemned. It is, of course, easier to dig up the roots when the ground has been softened by anti-monsoon showers or by the first monsoon rainfall, and at this time the work is usually done. The field is ploughed as soon as possible after the monsoon has set in, and, as the cultivators believe in deep and frequent tillage for tobacco, the plough is frequently used between June and August. The *hal* of Gujarát is a very light plough. The local work cattle are strong and active ; therefore the preparatory tillage is not particularly expensive, even though eight or ten ploughings are frequently given. But the extent of this tillage would be fairly represented by four good ploughings given by the Deccan plough. As a matter of fact, two deep ploughings by a really effective indigenous plough and the subsequent use of the bladed harrow or scarifier (which is much the same pattern in all districts) would, at less cost, produce tilth as good and as suitable for transplantation of tobacco seedlings as that produced by the usual numerous ploughings given in Gujarát.

Manure is applied when the field has several times been ploughed.

Manuring.

The soil of tobacco fields can in Gujarát usually be carted over without injury during breaks in the monsoon; therefore the practice need not be objected to. In heavy soil it would be preferable to apply manure in the fair season. Subsequent tillage would mix the manure thoroughly with the soil. Twenty-five to thirty cart-loads per acre of ordinary, well rotted, farmyard manure is the usual application. A better practice than this is to fold sheep closely on fields intended for tobacco in the fair season. 150 sheep for a week on an acre would give a full average application of manure, and 200 sheep would give a liberal dressing. The mud removed from village tanks is considered good manure for tobacco fields if given in sufficient quantity. Forty cart-loads or more per acre are usually given. The mud is dug out as the tanks dry in the fair season, and is then applied. If then spread on the field, the lumps crumble down owing to the heat of the sun in the day and the cooling of the air at night, and can, therefore, be freely incorporated with the soil during the monsoon by ploughing. It is easy to understand that village tank mud, as the water dries up, may furnish a fairly concentrated manure if the village is large; because the tank receives the greater part of the village sullage, and buffaloes and other cattle stand or wallow in its waters for hours daily during the greater part of the year. The water and mud is fouled thereby, but, of course, improved manurially. It is believed that, though sheep dung and tank mud are good for tobacco, cowdung manure, if well rotted, is best, because it produces rich, fine, elastic leaves. There is in India no positive proof about this, only hearsay evidence, and such must be accepted for what it is worth.

The nitrogen and potash of manure probably the most valuable ingredients for tobacco.

The results of American experiments indicate that it is the nitrogen and potash of farmyard manure which are most beneficial to tobacco, and that the effect of phosphates may be discounted. In India the storage of farmyard manure is not usually exemplary. On the contrary, it is usually bad in practice, and the elements which are most useful for tobacco are those which would be lost in greatest extent by careless storage. The manurial value of salt water for tobacco has already been referred to, and, when such is available, the dressing of farmyard manure or other manure is usually light.

Transplantation.

The seedlings are ready for transplantation when they have four leaves and three or four inches high. The field should now be levelled with the *samár*—a plank, which is used as a roller. The surface is next lined and cross-lined with the *gisle* which has four teeth at regular distances apart. The lines thus made may vary from twenty to twenty-seven inches apart. The seedlings are carried from the seed beds in baskets, and only such as have straight stems and well developed roots are planted. A seedling is planted carefully at each angle made by the intersecting lines, so that the roots occupy a natural position. A cloudy afternoon is usually chosen for planting. The seedlings thus get a whole night before being exposed to the heat of the sun. Frequent watering is required after transplantation. The seedlings are covered lightly with twigs and leaves of the *neem* tree until they are thoroughly established. Those that are weakly or die are replaced. Much of the success of the crop depends upon careful trans-

plantation. Light rain, in occasional showers, for a few days after transplantation is very beneficial.

Hoeing. Hoeing should begin as soon as the plants have made a fair start. A bullock hoe with a blade wide enough to work between the rows is used. The blade must not be too long, otherwise the roots are disturbed or the young plants damaged. Weeds which cannot be reached by the bullock hoe are removed by the weeding hook (*khurpa*). The plants should be planted in such exact lines that the bullock hoe can be worked either lengthwise or across the fields. Three double turns are usually given. In fact, hoeing should continue until the bullocks can no longer walk through the crop without doing injury.

Topping. When the flower bud begins to open, it ought to be removed and with it two to four of the youngest leaves. Ten to fourteen leaves should be left on each plant, the greater number in a rich soil. In some cases when small golden leaves are required for special purposes the plant is left untopped. When, however, it is topped, its whole strength is concentrated in perfecting the leaves left upon it.

Suckering. The removal of the flower buds when the plant is in full activity of growth is followed by the appearance of a number of side branches. These are known by tobacco growers as "suckers"—a significant term, but botanically they are not suckers at all. They should be regularly removed, because they use up the substance of the plant, thus deteriorating the value of the leaves. The removal of suckers involves much work. The field must be gone over many times in the season.

Irrigation. On *besar* soil (stiff clay loam) tobacco is raised as a dry crop. But, as a rule, tobacco in Gujarát is irrigated more or less according to the kind of tobacco to be manufactured. Tobacco meant for *jerdo* must get more irrigation than that intended for *kálio*. In an ordinary year irrigation begins early in November. Twenty days after the first watering a second is given, and afterwards others at intervals of twelve to sixteen days until the leaves are ripe, which is usually about the middle of February. In Gujarát the leaves are left on the plants either until they are decidedly yellow, or the colour has so far turned that the leaves would be considered overripe by an experienced European grower who thinks tobacco fit to cut when the leaf is brittle, crumbled on the surface, and covered with yellow spots.

Harvesting. Sometimes the entire tobacco plant is cut down; but the usual course is to strip off the leaves one by one from the stalk with a small bent sickle made for the purpose. The after-treatment of the leaves depends upon the kind of tobacco to be manufactured.

Manufacture. Two kinds of manufactured tobacco are commonly made—*kálio* and *jerdo*—and a third (*chopadia*) is occasionally prepared.

Kálio tobacco.

Kálio, used for smoking in the *hooka*, is made as follows:—The leaves, when stripped off the stems, are placed in threes, one above the other, on the ground. The threes are arranged in rows overlapping like slates on a roof. They are left thus exposed to the sun and dew for four days, and in the absence of dew are artificially damped. This half dried tobacco is built into heaps, and, when it has heated slightly, it is tied into bundles (*padas*). The bundles are again put into heaps and subjected to gentle fermentation. The heaps are turned every second day for about a fortnight, at the end of which time the tobacco ought to be cured. The bundles when cured weigh at Nadiád usually 1½ to 2 lbs. each. When ready for market, *kálio* is of a black brown colour. It is sold by the maund of 45 lbs. or by the 100 bundles. An average acre should yield from 1,000 to 1,400 lbs. The yield from a really good field may be 2,400 lbs. or more per acre.

Jerdo.

Jerdo or yellow tobacco gets its name from *jerdo*, the soluble yellow colour which is washed out of safflower petals when preparing the red dye. There are two kinds of *jerdo*. That made from tobacco irrigated with sweet water is used for smoking, whilst that irrigated with brackish water is used for chewing or snuff. *Jerdo* is prepared as follows:—Two days before the tobacco is cut, the field is copiously watered. The leaves when stripped from the plants are laid on the moist soil, and lie exposed to the sun and dew for eight days. The moist earth prevents rapid drying, so the leaves take a bright, yellow colour. After they have acquired a proper colour, they are tied into *padas* and stored in a house. They are almost dry when stored. Therefore they do not ferment and blacken. They mature slowly, and *jerdo*, when ready for sale, should be of a brownish yellow colour. With irrigation by brackish water very large crops of inferior *jerdo* are obtained —3,000 lbs. or more per acre. With sweet water an average yield is the same as for *kálio*.

Chopadia tobacco.

Chopadia tobacco is so called from the flattened "book-like" *padas* in which it is sold. It is only made from selected leaves which are dried, and coloured in the same way as *jerdo*, but more slowly, the process taking ten to twelve days. Leaves perfect in shape and ripeness are selected, and all of much the same size, and therefore only a proportion of any crop can be made into *chopadia*.

Diseases.

Tobacco suffers severely from parasites, both animal and vegetable. Various kinds of caterpillars do considerable damage to the seedlings and also to more mature plants. They can only be watched for, picked off and destroyed.

Of vegetable parasites the best known is a species of orabanche (broom rape), called in the vernacular *vacumba* or *ágio*. Its white, fleshy stems, ½" in diameter, furnished with scaly leaves and surmounted by pale bluish white flowers, may often be found underneath tobacco plants. The broom rapes are common in Gujarát, and attack brinjals and tomatoes, as well as tobacco. They attach themselves to the roots of the host, and feed on the juices of the plant, and thereby very seriously diminish the yield. Although constantly removed by the cultivators, a bad attack will destroy a quarter of the crop. The practice of continuous tobacco growing is so common and so favourable to *vacumba* that it is impossible to irradicate it.

It more or less appears every year, and when the season proves favourable, as it seems to do at short intervals, the attack is bad, seriously increasing expenditure and reducing the outturn. Cultivators think that *vacumba* is an outgrowth from tobacco and that it has no separate existence. It is, therefore, left in undisturbed possession of the field when the leaves have been harvested. It flowers and seeds on the tobacco stalks. These stumps are left to dry in the field instead of being dug up and burnt as they ought to be.

VARIETIES OF TOBACCO, BOMBAY PRESIDENCY.

1. *Sumátrá.*—Plant tall, inter-nodes of leaves being fairly far apart. Leaf has characteristic open habit of growth, with the upper surface slightly granulated and shining. It is narrow for a considerable distance near base, then widens gradually; and may best be described as spindle shaped. Midrib prominent, but not very coarse. Veins fine, straight, regular, not much branched. Texture fairly thin, fine, soft, elastic.

2. *Yával No. 1* (from Khándesh District).—Plant has a very low habit of growth, the inter-nodes being very close together. Leaf slightly granulated, very narrow near base, long and narrower throughout than any other variety, widest one-third length from base, very sharp pointed. Midrib prominent and coarse, particularly near base. Veins fairly prominent, rather irregular, branched to a considerable extent. Texture thick, coarse, soft.

3. *Yával No. 2.*—Plant with a fairly low set habit of growth. Inter-nodes short. Leaf fairly roughly granulated, large, broad, widest near base, ovate, point blunt. Midrib prominent and coarse. Veins and reticulations prominent and coarse. Texture soft, fairly thick.

4. *Shámru* from Nadiád (Kaira District).—Plant very low set habit of growth. Inter-nodes vere close. Leaf very granulated or crumpled, broad, greatest width one-fourth length from base, gradually tapers to moderately blunt point. Midrib, veins and reticulations all prominent and coarse. Texture thick, coarse, soft.

5. *Peelia* (from Kaira and Baroda Districts).—Plant fairly tall. Leaf granulated, large, widest about one-third length from base, narrow for very short distance from base, then widens abruptly, and tapers gradually to sharp point. Midrib, veins and reticulations prominent and coarse. Texture soft, thick.

6. *Kália* (Baroda).—Plant tall or moderately tall. Leaves somewhat granulated. Leaf narrow for short distance near base, then widens, broadest one-third length from base, moderately wide, long, sharp pointed. Midrib and veins fairly coarse. Veins and reticulations numerous. Texture fairly thick and soft.

7. *Kália* (Baroda).—Plant fairly tall. Leaf crumpled or very much granulated, long, broad, narrow for short distance near base, then widens abruptly, widest two-fifth length from base, thence tapers gradually to sharp point. Midrib, veins and reticulations long, prominent and coarse. Texture thick, coarse, soft.

8. *Kari-bágláni* from Chikodi (Belgaum District).—Plant tall. Leaf slightly granulated, large and moderately wide ; widest one-third length from base, very narrow for 2 or 3 inches near base, somewhat spindle shaped, sharp pointed. Midrib fairly prominent, moderately coarse. Veins not coarse and not much reticulated. Texture fairly thick, soft.

9. *Bhopli* from Chikodi (Belgaum District).—Plant tall. Leaf slightly granulated, folds double from midrib, characteristically narrow for considerable distance from base, large, long, spindle shaped, sharp pointed, resembles *sumátrá* somewhat in shape. Midrib prominent and coarse. Veins fairly prominent, but not numerous or much reticulated. Texture thicker and coarser than *sumátrá*.

Shendi-surte from Chikodi (Belgaum District).—Plant medium height. Leaves very slightly granulated, narrow near base, broadest one-third length from base, long, ovate, sharp pointed. Midrib fairly prominent and fairly coarse. Veins fairly prominent. Reticulations fine. Texture fairly soft, moderately thick.

An unnamed variety from Nadiád.

Dwarf, low set plant. Leaves very crumpled, short, very wide in proportion to length, widest one-third length from base and thence tapers slowly to a sharp point.

OPIUM OR WHITE POPPY—*Papaver somnijerum.*

Gujaráti, *Afin*; Maráthi, *Afu ;* Kánarese, *Afimu.*

The opium yielding poppy is believed by botanists to be a cultivated state of *Papaver setigerum*, a species which is wild on the shores of the Mediterranean, particularly in Spain, Algeria, Corsica, Sicily, Greece and Cyprus.

Origin of the plant.

The cultivated poppy was known to the Ancient Greeks, and was in India before the Aryans. It was introduced in Persia, India and China by Arabs. The crop appears to have been known in China at a very much later period than in India, but, when introduced, the spread of the drug was very rapid. The Chinese began the habit of smoking it, and the consumption got so great in China that the drug was largely imported into that country. This created a demand from India. The cultivation of poppy is now common in China, but the quality of the opium produced is much inferior to Indian.

Distribution.

The opium poppy is grown especially in Native States here and there throughout India, but its cultivation is mainly confined to three centres which yield the following opiums :—"Patna opium" in Behar, "Benáres opium" in the North-West Provinces, "Málwa opium" in Central India and Rájputána. The cultivation of opium in the Bombay Presidency is prohibited. The crop is grown to a considerable extent in the Kadi Division of Baroda.

Cultivation restricted.

I quote Duthie and Fuller as follows:—"In the plains poppy cultivation has been restricted by Government to certain well defined tracts in order to render its supervision easier, and hence its distribution is artificial, and is only partly dependent upon natural qualifications of soil and climate."

The system on which opium is grown for Government is as follows :— "Every cultivator wishing to grow the plant must obtain a written license to do so, and receives an advance in cash of from Rs. 12 to Rs. 13 per acre paid in two instalments—first, two months before the poppy is sown; and, second, one month after sowing. The whole of the produce is purchased by Government at a rate varying between Rs. 4-8 and Rs. 6 per *ser*."

Cultivation in Baroda.

The Baroda Government first licensed opium cultivation in 1878, and the cultivation is controlled in much the same way as in British Territory. The cultivator applies for a license for a given area. He gets an advance of Rs. 8 or Rs. 10 per *bigha* (⅝th acre) to enable him to buy seed and cultivate his land. The price of the produce is fixed at the same time. The area usually now exceeds 20,000 acres annually.

The first attempt to grow the opium poppy in Kadi was made by a Rajput who had seen it grown in Málwa. He failed. A Kunbi made a second attempt, and succeeded so well that his neighbours copied him. This first Kunbi cultivator started growing the poppy, because in a dream Máhádev offered him three handfuls of opium. This he took as a good omen, and began work.

General character of the plant.

The opium poppy is an annual 2′ to 4′ high. The stem branches freely. The branches, leaves and fruit (a capsule) are covered with a whitish bloom which easily rubs off. The flowers are white (occasionally tinged purple with purple spot at base). Seeds small, very numerous in one capsule, reniform, white or black.

Climate suitable.

The climate of Northern India probably suits the crop better than that of any part of the Bombay Presidency or of Bombay Native States.

Cultivation in Baroda.

The best soil is *gorádu*, a deep alluvial sandy loam. The crop is a *rabi* one. The season extends from October to March-April. The field intended for opium is ploughed and harrowed repeatedly during the rains. If it is in low condition, manure is given in fair quantity—ten to fifteen loads per acre. The plant is liable to run to leaf and stalk in a highly manured field. A fine degree of tilth and a fairly firm seed bed are necessary for the best results. Before sowing, the field is laid out into beds for irrigation. The seed is carefully broadcasted at the rate of 3 lbs. per acre in October, and lightly covered with a hand rake. In order to sow the seed equally, it is mixed with powdered earth or ashes. It is best to irrigate once before sowing, and sow the seed when the beds have sufficiently dried. Light irrigation is given frequently until the delicate young seedlings are fairly established. Then the field is watered every fortnight until the flowers appear. The crop requires careful hand weeding. The stirring of the surface soil with the weeding hook (*khurpa*) is also beneficial. The first weeding is given three weeks after sowing and a second and third at intervals of a fortnight. The plants are thinned out, so that they are 8″ to 10″ apart. The young plants so removed are used as a green vegetable. Poppies are ready to yield opium when the capsules turn a light brown colour and become somewhat hard. The juice is removed from the

fruit by scarifying it with a three-bladed instrument, called *náreni*. The blades are fixed ⅛th inch apart, so that they make three parallel scratches on the capsule. The implement is oiled before use. The cultivator in the evening makes deep scratches in the capsule from bottom to top. Only one part of the capsule is lanced at a time. To go round the whole capsule five to eight lancings are required with intervals of one or two days between each.

The morning after lancing a gummy juice is found exuding from the cuts. The substance is crude opium. It is carefully scraped off by means of a small iron scoop, and caught in a brass vessel which has previously been oiled. The juice is carried home and stored in earthen jars, and, when all gathered, is sold to Government. The outturn from a *bigha* is given at 10 to 12 lbs. (20 lbs. or less per acre).

The crop may also yield 200 to 250 lbs. seed per acre.

The crop is subject to many injuries. Frost is most dreaded. Dull, cloudy days and east winds are also bad. Monkeys cause much damage in the Kadi Division.

Poppy seed yields a clear limpid oil. The residue oil-cake is used as cattle food. In France the crop is grown entirely for its oil-seed. Poppy seed oil cake is a well known cattle food in the European trade, and the oil is largely used to adulterate olive oil, etc., and is suitable, because it is comparatively tasteless.

INDIAN HEMP—*Cannabis sativa*.

Natural Order—*Urticaceæ*.

Gujaráti, *Bhâng, Gánja*; Maráthi, *Bhâng, Gánja*; Kánarese, *Bhâng, Gánje*.

Habitat.

This plant has been found wild South of the Caspian Sea, in Siberia and probably in Central and Southern Russia. It appears to be wild in the Western Himalayas and Kashmir. It is acclimatized in the plains of India generally, and has gone wild in various parts, and can be found as a cold season annual in rubbish heaps and backyards generally throughout the plains of India.

Economic uses of the plant.

It is cultivated in India for (*a*) as a narcotic crop, (*b*) for its fibre hemp, (*c*) for the ripe seed from which an oil can be prepared. The usefulness of the plant for each of the above purposes depends a great deal upon the character of the soil, climate, altitude and other natural conditions of the country in which it is grown. In the plains of India the narcotic is the most valuable product. In the Himalayas and other colder parts or of high altitude probably the plant is most successfully cultivated for fibre and seed. The seed is eaten or pressed for oil, and is very commonly used in Europe as food for cage birds. The chief value of the Asiatic crop is the narcotic which it yields.

General character of the plant.

The plant is a coarse tall annual, with male and female flowers borne on different plants. Stems woody at base and usually about 5 feet high, but on rich, highly manured soil much higher. Male flowers terminal and on axillary drooping panicles. Female flowers fewer, axillary sessile.

Fruit enclosed in perianth, small, smooth, brownish grey. The plant requires for the proper development of the narcotic a dry climate and a fairly light rainfall distributed throughout the season in light showers.

Distribution in the Presidency.

The area is small, and has varied from year to year considerably. The total in some years is 2,000 acres, but in other years has declined to ⅓ or ½ the maximum.

In Gujarát, Surat grows a small area. In the Deccan the crop is grown in all the six collectorates, the Ahmednagar, Sátára, and Khándesh areas being the most important. The cultivation in the Karnátak is very trifling, and no hemp is grown in the Konkan.

Cultivation.

The Bombay cultivators are of the ordinary cultivating classes, but possess the special knowledge required to distinguish male from female flowers and the preparation of the drug.

The hemp plant requires good soil and careful tillage. It does best on fairly deep, friable, well drained soil. A soil formed in the Deccan by the admixture of light alluvium, washed from the uplands with the mixed black soil found at lower levels, suits the crop admirably. The patches in which hemp is grown are usually situate close to the village, and are naturally manured by village sullage, etc. It is useless to attempt to grow hemp on soil which is not in good condition. If the soil is in poor condition, a dressing of fifteen to twenty cart-loads per acre of old cowdung manure is required. The manure should be given in May, and then evenly spread over the surface of the land. The field should be prepared by once ploughing and repeatedly harrowing after the first fall of rain. A fine state of tilth—a friable, well prepared seed bed—is necessary. The seed should be drilled in June-July in rows 18″ to 30″ apart, depending upon the character of the soil and its condition. The seeds are small, and require very careful sowing. To secure even distribution, the seed should be mixed with fine earth or ashes before sowing. The drill should work near the surface, otherwise the small seed will be buried too deeply for successful germination. The usual seed rate is 8 to 10 lbs. per acre, but this is really more than is required. Superfluous seedlings are thinned out when they become fairly established. In really good land the rows ought to be 2 to 2½ feet apart, and the seedlings should be thinned out to a foot apart. The distance will be increased by the subsequent removal of male plants. Young hemp plants are used as a delicate green vegetable. One hand weeding at least is necessary, and the bullock hoe should be used repeatedly until the plants are so advanced in growth that they are damaged by the bullocks working the hoe. In September-October the cultivator seeks diligently for male plants. These are removed by uprooting daily as they are found. If the female flowers are fertilized, the narcotic principle is very poorly developed in the plants. A very few male plants, if left, are sufficient to fertilize the female plants in a whole field. Sufficient space should be left between female plants to encourage lateral branching. Lateral growth is induced by giving the stem near the root a half twist round, thus bruising the tissues and arresting growth for the time being. The crop is ready in November-December or December-January. If the late rains are deficient, two or three waterings from a well or other source of irrigation may be required. The crop is harvested

by cutting all flower bearing branches along with about one foot of the branch stalk.

Preparing the drug.

A beaten threshing floor is prepared, and on this the flower bearing branches are left to exposure and the influence of dew for one night. Next day these branches are heaped in small heaps with the tops in the centre, and are trampled and trodden down by men. Layer is added to layer, and the trampling repeated daily for four days. The result is that the flower heads are pressed flat, and *gánja* is obtained by winnowing and picking these flower heads by hand from the chaff and broken flower heads, which mixture is known as *bhánng*. *Gánja* and *bhánng* are separately stored in gunny bags. In the Ahmednagar District the resinous substance (*charas*) which adheres to the feet and hands of men who trample and press *gánja* is scraped off, and saved for private consumption, but not for sale.

Gánja.

Gánja as prepared in the Bombay Presidency is considered somewhat milder than the Upper India drug by those who have smoked *gánja* in Upper India, as well as in the Deccan. The mildness is attributed to the practice in the Deccan of harvesting the crop at a more immature stage than is customary in Upper India. In the Deccan the use of *bhánng* is much more limited than that of *gánja*, the latter for smoking being much the more important drug.

How *gánja* is smoked.

Gánja is not subject to any special treatment until it passes into the hands of the smoker who breaks it into small bits, removes seeds, leaves, and foreign matter if there be any. He then places the broken *gánja* in the palm of his hand, and pours water over it three or four times till the water runs off clear, kneading the *gánja* at each watering. If properly done, the process takes ten minutes. During the process the *gánja* gets sticky. It is then squeezed free of water between the two hands. A small cake is left, from which pieces are broken and mixed with an equal quantity of tobacco, and smoked in an ordinary native pipe. In very rare cases *dhatura* or nuxvomica is smoked with *gánja*, and the admixture, of course, increase the intoxicating effect.

Bhánng.

Bhánng as sold in the bazar is first picked to remove pieces of stalks and other impurity, and then washed with water. Subsequently it is ground into a fine paste on a grind stone with a few grains of black pepper. Hindu ascetics prefer a mortar and pestle of *nim* (*melia azadiractes*) to a grind stone. The paste is stirred in water and strained through cloth, and the filtrate drunk either with or without sugar. This is the simplest and cheapest form of *bhánng* for drinking. Those who can afford it add ground almond kernels, and flavour with cardamoms, etc.; and well-to-do, habitual drinkers buy raw *bhánng* in quantity, boil it in water for two or three hours, and then wash it clean of all impurities. It is then dried and stored for use. Subsequently, as required, it is ground into powder, infused with water, and drunk as described above. *Bhánng* is never drunk without a seasoning of black pepper, but often it is seasoned with almonds or mixed with milk sweetened with sugar or sugarcandy, and flavoured with some or all the following articles of the *bhánng masála* :—Poppy-seed, rose petals, fennel, nutmeg, cardamoms, black pepper, and *kasni* seed (*Cichorium endivia*).

Charas is used in smoking only, and its use for this purpose in the Deccan is rare. As a rule, *bhâng* is not smoked unless the smoker of *gânja* is hard pressed for supply of his favourable drug. *Charas* requires no preparation before its use. It is simply made into small pills, and smoked either with *gânja* or tobacco according to the choice of the smoker. *Gânja, bhâng* and *charas* deteriorate with keeping. They keep good for a year, but deteriorate in intoxicating qualities afterwards.*

Charas.

Messrs. Duthie and Fuller in their "Field and Gardan Crops" describe the separation of the fibre from the hill crop of India thus :—

The fibre from hemp.

"The stalks are then laid in water to promote fermentation which will allow the bark to strip off. On being taken out, they are beaten with mallets to loosen the bark which is then detached by hand in strips, and after a second beating, breaks up into fibre which is made up into hanks for sale. In some places the fibre is boiled in potash, and bleached before spinning. The principal things manufactured from it are hemp cloth (*bhângra* or *bhângela*) and the ropes which are used for swing bridges over hill streams. The cloth makes an admirable material for sacks, and is largely used in the grain trade on the Nepaul frontier, and latterly in the export of potatoes from Kumaon. It also furnishes a large portion of the hill population with a characteristic article of clothing—a hemp blanket, worn, like a plaid, across the shoulders and fastened in front with a wooden skewer."

The Cultivation and Manufacture of *Gânja* in Madras.

(By C. Benson, Esq., M.R.A.C., Agricultural Department, Madras.)

The true hemp plant (*Cannabis sativa*), though grown here and there in most parts of the Presidency in backyards, is found as a regularly cultivated field crop in only two localities, *viz.*, in the Malayali villages on the Javadi Hills in North Arcot and in one or two villages in the Bapatla Taluk of Kistna District. It is also raised to a certain extent in the hilly part of Vizágápatam and Ganjam, but there seldom more than a few plants are grown by each person.

The *Javadis* are a low hill range, covered with jungle, amongst which the Malayali villages lie scattered, few of them consisting of more than three or four huts. Each village has a small patch of land cleared for cultivation near by, and there, in almost all cases, a plot or two of hemp will be found growing. The Malayalis claim to be Vellalas, but except for purposes of trade and barter, have little or no connection with the people of the plains. They also claim to alone possess the knowledge necessary for the manufacture of *Gânja*—a practice which has been carried on, they state, in these hills from time immemorial. They attribute the fact that the growth of the crop is confined to the hills merely to the ignorance of the people of the plains, and state that, if the latter knew how to deal with the crop, they would easily grow it outside the hills.

*The notes are chiefly extracts from evidence submitted to the *Gânja* Commission by Mr. Yashvant Nilkanth, Superintendent of the Office of Survey Commissioner and Director, Land Records and Agriculture.

On the hills cultivation is carried on in small plots, the natural fall of the ground preventing any considerable tolerably level area being found in one place, although to a certain extent the plots are terraced. In these plots the Malayalis raise the ordinary dry food grains of the country for their own consumption, and with them the hemp plant alternates, hemp not being ordinarily taken on the same land in two successive years. The soil is free, friable and open, derived directly from the rocks on which it rests, thoroughly well drained, and appears to be fairly fertile. For hemp it receives a heavy dressing of cattle dung, without which it is said to be hopeless to raise the crop. This manure is spread on the surface in May or June before the first rains allow of ploughing being begun. As soon as the land is sufficiently moistened, it is ploughed, and the operation is repeated three or four times at convenient intervals until some time in July, when the seed is sown. Sowing is done by dropping the seed, at the rate of five or six seers per acre, in a furrow opened with a plough, the seed being covered with soil drawn over it by the feet of the sower. The seed is sown in rows about 3 feet apart, and during the growth of the crop the spaces between the rows are worked and kept clean by ploughing and weeding. The young plants appear in about a week after sowing, and when about three weeks old they are partially thinned out, and when they reach to a foot high they are earthed up by means of a plough which is run along on either side of the rows. This latter process, aided by hand weeding at intervals of about a fortnight, thrice repeated, keeps the whole land clean.

When the crop is about four months old, the anxieties of the cultivator commence, and the crop has to be examined carefully and frequently, so that any male plants—called female by the ryots—may be detected and removed. Detection of the male plants is only possible when the flowers appear. Their entire removal is absolutely essential to securing a crop of *gánja*, as otherwise the whole crop runs to seed. The removal of the male plants is a continuous process going on as the plants are detected. Notwithstanding this care, a certain amount of seed actually sets.

Some time early in January the harvest begins. It continues up to March. Plants are ready for cutting as soon as the leaf turns yellow and begins to drop. At the same time the spikes of female flowers also turn yellow. The crop is never cut on a damp or cloudy day.

In harvesting, the ripe plants are cut bodily, tied into small bundles, and carried to the threshing floor of the village. There the spikes are stripped off the stems, with a few of the leaves, and the stems are thrown away. The material thus collected is spread out on the floor in the sun during the middle of the day for three, four or five hours, and then loosely rolled in the hand to work out such seed as may have been formed and to break up the leaf that remains. This working also causes the spikes to stick to one another to some extent. The broken leaf is then winnowed out, collected, and powdered.

The manufacture then begins. A closely woven bamboo basket is taken and dusted inside with leaf powder. Into it is placed a layer of the spikes an inch or an inch and-a-half deep. The spikes are then trodden under foot by a man working round and round on his heels in the basket four or five times, the man supporting himself on a stick, whilst the basket is held steady by two others. If the basket be large enough, two

men do the treading, grasping each other's shoulders to steady themselves. Layer over layer of the spikes is thus made in the basket till it is full, each layer being separated from the next by a little leaf dust. When the basket is full, its contents are turned out on a piece of flat hard ground, and on the top of the pile a large flat stone is placed, upon with are piled other stones to weight and compress the heap. The weights remain thus till next morning at about 8 or 9 A.M., when each layer is taken out separately, broken into small bits, and spread in the sun to dry. Whilst spread out thus, the pieces are trampled on with the heel and turned over from time to time to secure proper drying. In the evening the pieces are again re-piled and weighted, and next day again turned out to dry, the process being repeated till the whole is thoroughly dried.

Great importance is attached to the thoroughness of the treading, the sufficiency of the pressing, and the completeness of the drying, the quality of the drug being said to depend on the manner in which these processes are carried out. If the cakes are not dried sufficiently, they appear green, and are of inferior quality—good *gánja* being brown.

When fully cured, the cakes are stored in the ryots' houses, where they are packed in date mats in bundles, each containing twenty visses (say, 60 lbs.), and kept under pressure till sold to dealers.

In *the Kistna District*, the soil, the conditions under which the crop is grown, and the method of manufacture all differ entirely from those described above, as much as they do from the practice in Bengal, according to Dr. Prain's description. It is only in one village, Daggupád, in the Bapatla Táluk, not far from the borders of Nellore, and about fifteen miles from the sea coast, that any considerable area of the crop is to be found, although a little is also grown in one or two of the neighbouring villages. The country is a wide open plain of black cotton soil, and from its appearance badly or poorly drained. The soil is not particularly stiff for the description concerned, being, in fact, a good stiff loam, and contains a considerable amount of *kankar*. On the land on which hemp is grown, the common crops with which it usually alternates are noted on the margin. The crop is grown in open fields, some near to and some at a distance from the village, but all reasonably accessible. In some cases it is cultivated, and handled by the ryot who owns the land, but more frequently the cultivation of the land and all the cattle labour required is supplied by the ryot, and the planting and handling of the crop is undertaken by others—chiefly Mahommedans, of whom there is a considerable settlement in this village. Here, as in Bengal, the plants are raised in seed beds and planted out, but except at the time of planting no irrigation is resorted to after the crop is put out into the field.

Jonna (Sorghum vulgare).	Coriander.
Variga (Panicum miliaceum).	Tobacco.
Dry paddy.	Indigo.
	Chillies.

The seed beds are usually made on the bund of a tank, and are 6 feet wide by 60 feet long. The soil of these beds is dug up with a crow-bar, and reduced to a fine tilth and levelled. Seed is thus sown at the rate of four or five seers (of 85 tolas) to a bed, two such beds supplying plants sufficient for an acre of land. The seed is covered with earth strewn over it by hand. The bed is then watered by hand, and the watering is repeated daily for about two months as required. The sowing takes place

in August. When the plants are 2 feet high, they are topped off, and in a few days numerous side branches are put out. The plants are then transplanted into the field.

Land intended for hemp may have carried a crop of hemp in the previous year- 19 out of 118 acres planted in Daggupád this year (1893-94) being said to have carried hemp in 1892-93—but more usually the crop is alternated with one of those mentioned above. If it follows hemp, heavy manuring is necessary. Cultivation of the land for the crop usually begins with ploughing in July, and between them and October it is ploughed about three times and finally worked with the three tined grubber (*gorru*, or seed drill used without its seed hopper and tubes). It is then marked off in 2 feet squares with a marker, similar to the *guntaka*, or scuffle worked without its share. At the angles of each square four or five plants are dibbled into a hole made with a stick, and they are watered to set the plants. The crop is planted out in October.

The land intended for this crop is manured either with cattle manure or by sheep folding, the application of manure being considerable when the land carries hemp successively year after year.

A month after planting the fields are hand weeded, and about a fortnight later a plough is run between the rows, and the plants are earthed up slightly. Two months after planting out, flowering begins, and then the removal of the male (here as elsewhere termed *female*) plants begins. They are cut off near the roots and thrown away. This work goes on continuously as long as male plants are found.

About February the plant begins to ripen, and the harvest commences. It goes on till the end of March. The plants are cut bodily with the sickle, and are laid out in the field, where they lie for three days to dry in the sun. On the fourth day they are tied into small bundles of about ten plants each, and then piled, head and tail, in the field. The heaps are opened, and the bundles re-piled next day, the process being repeated over several days. When the quantity to be dealt with is small, and space allows, the bundles are carried to the grower's house, and there piled; but in all cases the crop is finally carried to the house, and a month later the spikes are removed. Each spike is plucked off by hand, and then they are spread out on a hard floor in the open for one night in the dew to soften and become pliable. In the morning the spikes are collected and stored in large gunny bags, being packed closely therein by a man treading them down into the bag. The produce is then ready for sale, and may be kept for as much as two years.

In both localities it is stated that of late years the area planted with hemp has been reduced, the price offered for *gánja* having fallen with the restriction of the demand owing to the introduction of the system of licensing retail vendors.

A few years ago the crop was also grown to some extent in one village in the Pulivendla Táluk, Cuddapah District, but its growth there has now been abandoned. It was then grown as a garden crop, in rotation with garden *korra* (*Setaria italica*) or garden *rági* (*Eleusine coracana*), the plants being raised in seed beds and then planted out. The method of manufacture adopted there appears to have resembled that still followed in Kistna.

ARECA OR BETEL-NUT OR SUPA'RI-PALM—
Arêca catechu—Linn.

Natural Order—*Palmæ*.

Tribe—*Arecineæ*.

Gujaráti, *Sopári*; Maráthi, *Supári*; Kánarese, *Adike*.

Habitat.

This palm is a native of Cochin-China, Malayan Peninsula and islands. It is cultivated throughout tropical India, but does not thrive at any great distance away from the sea.

The gardens in Kánara.

Betel-palms, cardamoms, and pepper are the chief crops grown in the garden lands of Kánara. In old established gardens there may be a few jack fruit and cocoanut trees, also plantains, limes, coffee bushes, and pineapples. These gardens are chiefly found in Sirsi and Siddápur Tálukas, and in the whole collectorate extend to some 17,000 acres. They generally occupy the bottom lands of narrow valleys. The most favourable situations are in valleys which have the slopes on both sides fairly extensive, moderately steep, and covered with forest growth. The forest growth gives beneficial shade and shelter, and supplies the gardens with branchwood, leaves, and litter for manure and other purposes. The garden land extends usually in a narrow strip along the course of any particular valley, and is sub-divided according to ownership. Bottom land which is open and cleared appears to be more suitable for rice beds than for spice gardens. Some garden occupants also own rice land, but most commonly they only cultivate garden land. An owner may own three or four acres, sometimes more, often less.

The gardeners.

All garden owners are *Haviks*—a shrewd and hard working, well behaved class among the Bráhmins. They are supposed to have come originally from Mysore. Their methods of cultivation are almost identical in all gardens, and presumably are ancient in origin. The methods adopted are successful in practice, and although they appear at first sight extraordinarily antiquated to a casual onlooker, they may, like other time-honoured Indian practices, be found on full enquiry the most suitable for the existing natural conditions of the district. The *Haviks* are well-to-do, as evidenced by their commodious, well built houses which in many cases are roofed with Mangalore tiles.

How the gardens are arranged for cultivation.

The narrow strips of spice gardens follow the course of the old *nálas* which drained the valleys before the gardens existed. When the gardens of any particular valley were first formed, the bed of the *nála* was levelled and also the bottom land along its course. Since that time the slopes on either side have been gradually cut away, and many of the old gardens are now bounded laterally by almost perpendicular cuttings 10′ to 20′ in height. These cuttings present a complete barrier against trespass by man or beast, and shelter the gardens from storm and wind. The occupants' house and buildings are close to the garden, above the cuttings, usually in a cosy fairly dry situation. A garden is entered by descending a steep narrow pathway or by rude steps which lead to a plank bridge over a ditch at the bottom.

Rainfall; drainage.

The rainfall of the district is heavy, and the positions of the gardens are such that much drainage water must pass through them. Drainage is thoroughly arranged for by main ditches cut along the course of the garden strips and by cross minor ditches which carry water to the main drainage channels. The main channels are bridged here and there as required by long slabs of stone or by three or four pieces of palm stem placed side by side. The heavy rainfall and the flood of drainage water in the monsoon undoubtedly wash much of the garden land away, and more particularly so if the soil is not of a particular kind.

Soil suitable; how renewed.

The most suitable soil is called locally *kágdáli*. This is a yellowish red or reddish brown earth which usually exists in deep beds as the side cuttings of the gardens show. In these cuttings rock of a soft nature sometimes obtrudes a few feet below the surface, but more often the whole depth of cutting is soil-like in character, and appears in layers which vary somewhat in consistence. There are no definite lines of demarcation between layers; but near the original surface, generally, there is sometimes a gritty or gravelly section which is considered inferior. Further down there is a layer which presents a shaly appearance which deceives the eye. At first sight it appears hard, durable or rocky, but a piece can easily be broken off by the hand, and, if squeezed or rubbed, crumbles into an impalpable powder which feels moist and soapy. This soil material as seen in the cutting has a peculiar metallic lustre, but when crumbled is simply a fine argillaceous yellow earth, extremely retentive of moisture, and which under pressure becomes consolidated, so that running water does not readily remove it. It is easy to understand that a soil of this class is suitable for a spice garden. It does not matter much whether the soil is naturally fertile or not, because the yield of the crops grown is mostly affected by the quantity and quality of manure directly applied. As regards the soil, the chief point is that it must be of such consistence that it can withstand the denuding effect of flood water and be so retentive of moisture that little or no irrigation is required in the fair season.

Irrigation.

In many gardens irrigation is not required even in the hot weather. At this time a trickling stream fed from natural springs may be seen running along the main channels or a perennial *nála* passes by the main channels through the garden. The soil is thus kept continuously moist. In such gardens ferns and mosses in great profusion and variety grow along the drainage channels. In other gardens not so favourably situated a little irrigation may be required in March, April, and May, and this is arranged for from a tank or tanks usually built of stone and not very capacious, which tap the waters of natural springs.

How the gardens are laid out.

In laying out a garden the soil is first levelled, and then the drainage channels are made. The main channels are about 4 feet deep and 4 or 5 feet wide at the top, with sides having an easy slope to the bottom. The minor cross channels are 1 foot wide and about 18″ to 2′ deep. These channels are exactly parallel. They are distant from each other 12 to 15 feet. The space between is called *bharan*. The *bharan* has a rounded surface. It is highest in the middle, thus rain water drains freely to the

channels. A pathway runs along the middle of each *bharan*, or rather by usage the middle of each *bharan* becomes a pathway. On each side of the pathway, in old established gardens, a line of alternate betel palms and cardamoms are found with pepper plants trained on the stems of the palms. The palms are 6 to 8 feet apart in the rows. It takes, however, many years of patient labour before the garden gets to this stage. When a new garden is made, the *bharans* are thoroughly dug and weeded. Plantains are planted along the water courses. They give some direct return for expenditure incurred, but the object in planting them is to provide shade for the betel palms. When the plantains afford sufficient shade, pits 2½ to 3 feet square and 2½ feet deep are made. Leaf manure and pieces of plantain stems are put in the bottom of the pits, and then excavated soil partly filled in. The young palm trees 4 or 5 feet high and three or four years old are planted in these pits, and sufficient of the excavated earth put round and pressed on the roots to keep the plants straight.

Cultivation.

The palms are raised in seed beds, and are once transplanted before they are planted out permanently. The first seed bed is carefully prepared, the soil is dug, broken fine, and mixed with leaf mould. Fully matured nuts from old trees are specially selected for planting. These are planted about 9 inches apart in April. The seed bed should be kept thoroughly moist. The shoots appear in June. The seedlings are transplanted in October into any moist place in the garden or along the water courses about 2 feet apart, and remain thus until permanently transplanted. This permanent transplantation is usually done towards the end of the rains. In the following March the trees are manured with leaf manure, and the manure is covered with fresh cut branchwood which is partially withered, but which retains the leaves. The object of placing a layer of small branches above the manure is to break the force of heavy rain. The rain soaks through the brushwood, moistens the manure, but does not carry it away as would be the case if it were uncovered or covered with soil or in any other ordinary way. The betel trees are manured as described every second year, and come into bearing in ten years or so. The plantains are maintained for some years after the betel palms are permanently planted, but in time are removed, and the cardamoms are planted between the palms, and on the stems of the latter pepper vines are trained. The *bharan* gets more or less washed away during each monsoon and the channels more or less damaged. This to some extent is prevented if plantain leaves, dried grass, and other available rubbish is put on the surface. But, despite any precautions, the *bharan* is more or less denuded. The earth from the pathway is, therefore, moved to repair the drainage channels, etc., and new *kágdáli* earth is brought in in head-loads from the cuttings which border the gardens, and placed along the centre of the *bharans*. This renewal is necessary at least every third year. It is an expensive operation, but if the excavation from the cuttings is done in a systematic manner, the area of the garden can be gradually extended. The trees in the first plantation of betel palms generally stand wide apart, but, as they grow, other young trees are planted between them. A nursery is always maintained to provide young trees for this purpose and to replace those which die from time to time.

Yield.

Betel trees are known to fruit freely for thirty or forty years, and there is a popular belief that they are sometimes profitable much longer. On an average each tree has two

bunches of fruit, sometimes three or four. But two good bunches yield as much as three or four inferior ones. The size of the bunch depends upon the manure used and upon the rainfall. A good bunch gives 200 to 300 nuts, and a specially good one about 400. With unfavourable rain or cloudy weather in April or May many of the young nuts fall off, and a smaller number of nuts on each bunch reach maturity. The trees produce flowers in March and April, and the nuts are ripe in November or December, but to some extent the trees produce flowers and fruit out of season. Immediately below each bunch there is a frond or leaf. It with its sheath remains attached to the tree for about two months after the inflorescence comes. Then these leaves fall to the ground. A few additional leaves fall during the monsoon. The sheaths of the leaves are a valuable product in the garden economy. They are used to provide hoods for protecting the branches of betelnuts from the rain. If unprotected, the nuts rot. Two sheaths are used to make one hood.

How sheltered.

The sheaths are skewered together to form a hood by means of thin pieces of split bamboo in a manner which is easy to demonstrate, but difficult to describe in writing. The hood is made adjustable in a very ingenious manner, and when it is bound round the bunch with thongs of plantain bast, it efficiently wards off rain.

The hoods are made and tied on by professionals who come from Mysore Territory and below the Ghâts. A good workman can make 250 hoods per day, and is paid Rs. 2 per 1,000. This operation and tying them on costs at contract rates Rs. 10 to Rs. 12 per 1,000 bunches and two meals per day. The men do not ascend and descend each tree. When once they have climbed up, they by means of slight exertions swing the tree and deftly catch hold of another and rarely descend to the ground for hours. These expert climbers also gather the fruit by cutting the bunches from the stem getting Rs. 4 per 1,000 bunches and three meals per day. Some garden owners or their regular servants are experts in making hoods, in adjusting them, and climbing the trees. It is extremely interesting to note the manner in which the work is done. The climbing in the fair season looks extremely simple and easy to an onlooker, but in the monsoon with falling rain the tall smooth stems are slippery, and the ascending process is much more difficult. The climber first ties his feet together round the insteps with strong bands stripped from the sheath and leaves of the betel palm. This helps him to grip the stem with his feet. He carries with him slung round the neck a wooden rest on which to sit when he gets to the top. This rest is shaped like a two armed pick, and through a hole which corresponds to the shaft hole of a pick, a rope is passed and spliced, so that it is endless. When the fruit is reached, the rest is unslung and attached to the tree. The doubled end of the rope is passed round the stem, and is long enough to pass over the two prongs of the rest, and, when drawn tight, secures the rest to the tree. It does not slip down, because the circumference of the stem increases downwards, and the rings in the tree offer obstuction to sliding or slipping. The operator sits resting one thigh on each wing of the rest, and one hand at least is comparatively free to fix the hood over the bunch of nuts or to sever the bunch when ripe from the stem. The bunches when ripe are lowered to the ground by being slung to a rope over which they ride. Any one who has seen a bunch of betelnuts can easily deter-

How gathered.

mine how the bunches are placed on the rope. They rapidly slide down, and are caught by a man who holds the end of the rope at the ground. The stretched rope is held inclined at a considerable length from the tree.

How husked.

The bunches on a tree ripen unequally—the lowest bunch first, the uppermost last. Moreover, in the same bunch some nuts may be ripe and yellow and others unripe and more or less green. The ripe nuts are much the same size and shape as small apples. The outer skin is yellow, smooth and shining. The inner husk is very fibrous and not easily removed. The first process in preparing for market is to remove the husk. This is done very deftly by means of the *hatti-gatti*. It is an implement like a sickle. It is fixed at the heel end of its blade securely into a hole near one end of a plank, somewhat in the same way as if it were fixed in a handle. The back of the blade at the bent part rests in order to steady it in a notch in the plank. The blade of the sickle is presented in an upward position opposite to the workman. He sits on the other end of the plank. The plank is about 3 feet long, 1 foot wide, and 1½ inches thick. The husk from each nut is cut out in sections. A nut is grasped in the palm of the hand, and pressed against the point and blade. The husk is thus cut through to the nut, then by leverage a section of husk is jerked off. The nut with remnant of husk is turned in the hand so quickly that to an onlooker the action appears involuntary, and another section of the husk is removed like the first. With four or five movements of this sort the whole husk is removed. A clever workman can husk 5,000 nuts per day, but 3,000 is nearer the average. The contract rate for the work is one anna per 1,000 with two or three meals per day. The husked nuts are scraped free of fibre, also by the *hatti-gatti*. The process is essentially a scraping process, and costs at contract rates 1½ to 2 annas per 1,000.

Boiling the nuts.

The scraped nuts are next boiled for about two hours in fairly large copper pots. A handful of lime or of the ash of the bark of *matti (Terminalia tomentosa)* is added to the water. The presence of lime causes the water to become red or red brown in colour as the boiling proceeds. The water also becomes thick with a resinous extract from the nuts. The boiling is continued until the eye bud or germ of growth from each nut comes out or becomes absorbed in the extract. The nuts are removed by a long handled ladle (*sdra*). The ladle has perforations in its bowl, which allow the extract to drain from the nuts back into the pot. The extract is again and again used for boiling fresh supplies of nuts, pure water as required being added from time to time to prevent the decoction becoming too thick and concentrated. The extract, after being used for boiling repeatedly, becomes deep red brown and thick. It is then emptied into another broad mouthed vessel which is placed under full exposure to the sun. The mass by evaporation thickens, and "Areca catechu" or *kossa* is the product. The nuts after boiling are dried in the sun, and sorted into three kinds—*chikni*, *betta* and *golu*.

Variety.

Chikni.—These are unripe fruits got mostly from the upper unripe bunches of the tree. They become flat when boiled, and when cut are light coloured and agreeably flavoured. They sell by retail at a high price, but by the growers are usually mixed with the other sorts to ensure a satisfactory sale of the

whole produce. These nuts after exposure to the sun are again soaked in the red extract, a basketful being immersed at a time. They are again exposed daily to the sun for four or five days, but are gathered up at night, otherwise they get dark coloured. The nuts are exposed to the sun on cane matting spread on a *mandap*. Sometimes bamboos or other means of support are placed over the inner court of the household, and the matting spread over this framework. The nuts when dry are ready for market, and should be shining and bright red brown in colour.

Betta.—These are ripe nuts. They are dried after the first boiling and then hand rubbed with fairly thick extract to which 3 or 4 per cent. of lime has been added. This tends to deepen the colour. The process may have to be repeated two or three times. The colour becomes fixed by drying in the sun after hand rubbing. When ready for market, they are somewhat lighter coloured than *chikni*, and not so glossy or shining. They are rounder and larger.

Gotu.—These are fully ripe or overripe nuts. They are usually fairly well coloured by the first boiling, and after exposure to the sun for several days are ready for market. The colour may be deepened and improved by the same means as described for *betta*.

Value.

The three varieties are usually packed together by the cultivators in sacks. Sirsi and Kumta are the chief markets. Ordinary prices for the three varieties are :—

Chikni	...	...	Rs. 6 to 7 per maund of 48 seeers of 20 tolas.	
Betta	...	...	„ 3 to 4	do. do.
Gotu	...	...	„ 2 to 2½	do. do.

Betel palms are not much affected with disease. A borer does considerable damage. The borers cut a tunnel from the root upwards, and in time reach to the growing top. The damage there done is so considerable that the top withers, and, when wind blows, breaks off and falls to the ground.

CARDAMOMS—*Elettaria Cardamomum*—Matton.

Natural Order—*Scitaminex*.

Gujaráti, *Elchi*; Maráthi, *Veldode*; Kánarese, *Yálakki*.

Habitat and general character of the plant.

This plant is indigenous in West and South India, and is found plentifully in the rich moist forest soils of Kánara, Mysore, Travancore, etc. It is a perennial herb. A full grown healthy plant is 6 feet or more high. The leaves are lanceolate, narrow, long, and have rather long petioles. They grow somewhat like ginger from rhizomes. The inflorescence is a spike, and it grows on a scape or leafless stem which springs from the rhizomes. The scapes grow horizontally, and spread over the surface of the ground. The fruit, which is the commercial product, is a three celled triangular capsule with a yellow white leathery covering which encloses numerous small black angular seeds. These have a fragrant taste and aromatic odour. The rhizome increases in size from year to year, and an

old plant, therefore, produces a larger number of flowering stems and leaves than a young one. The leaves, etc., die down annually. New growth springs up. The plant can be propagated by sub-division of the rhizomes or from seed.

Kánara gardens and soils.

The crop is extensively grown in the betel palm and pepper gardens of the Sirsi and Siddápur Tálukas of Kánara. It thrives under the same conditions of soil, etc., as betel palms and pepper, but by preference is grown in a cool, very shady garden with soil kept continuously moist by favourable position. The essential conditions for successful cultivation are:—

(*a*) A soil of loam or clay loam consistence kept by favourable position moist, but not wet at all seasons.

(*b*) The garden should by its natural situation be protected from strong winds, and shade trees should be provided.

Cultivation.

If rhizomes are used for propagating the crop, they are sub-divided, and the sub-divided portions planted with their leaves attached in pits. The pits should be 18″ square and deep, and be re-filled with the excavated earth mixed with a good portion of leaf manure. The rhizome should be lightly covered with soil, and on no account be deeply buried. In Kánara the crop is chiefly raised from seed. The seeds are small, and therefore to secure even distribution in the seed bed should, before sowing, be mixed with fine ash. A well prepared seed bed with smooth, friable, well manured soil is required.

Seed bed.

The manure should be old and thoroughly decayed, so that it can be crumbled into a fine powder. Manure of this class, if mixed freely with the upper soil, gives the degree of tilth most suitable for germinating the small seeds. Leaf manure is best. The seed when sown should be lightly covered. A bed 8′ × 4′ requires about 2 tolas of seeds. Some authorities recommend that the seed before sowing should be artificially germinated in folds of cloth or flannel kept moist, but not too wet. The seeds as soon as they have struck should be shaken off the cloth on to the surface of the seed bed and lightly covered with fine soil. The seed if sown in the usual way takes a considerable time to germinate—usually a month. The sowing season in Kánara is in September-October. The beds require protection from sun or rain. This can be accomplished by the shelter of a raised platform covered with branchwood. The platform should be 3 or 4 feet high. The shade and shelter thus afforded is beneficial during the whole period during which the seedlings occupy the seed bed. The seed beds can be sufficiently protected from rain by placing branchwood immediately over the surface. This is usually the only protection given if the seed bed is otherwise naturally well sheltered. The leaves and branches of the *nelli (Phylanthus emblica)* are considered best. The reason why they should be considered superior for the purpose is perhaps open to conjecture. It is confidently asserted by the cultivators that the leaves and branches of this tree and other trees common in the district prevent insect attack. The leaves, fruit and bark of such trees contain tannic acid, astringent resins, and essential oils, and therefore it is possible and perhaps probable that the presence of such branchwood and leaves in contact or close proximity to young seedlings may be poisonous or disagreeable to insect life, and may deter insects from causing damage to young seedlings.

Seedlings, if they come up thickly, should be thinned out. The plants that are left should remain in the seed bed for four or five months. The beds must, in the meantime, be kept moist. Rice beds adjoining the garden are used sometimes as a nursery when the cardamoms are first transplanted. Water must be available. A series of narrow channels are cut in the rice bed parallel to each other and 2 to 2½ feet apart. The excavated soil is put on the spaces between the channels. Thus flat ridges and narrow channels are alternately formed. The cardamom seedlings are planted on the ridges, two rows on each and at a distance of 9″ to 12″ between plants. A *mandap* is erected about 5 feet high, of light bamboo or other available material. Palm leaves are spread on and tied to the bamboos, and these give sufficient shade and shelter. The irrigation water is, in the fair season, so distributed that it trickles through all the channels continuously. The ridges are thus kept sufficiently moist, but not wet. In the monsoon the irrigation and drainage water must be directed as far as possible away from the nursery. The seedlings are kept in the nursery for fifteen to eighteen months. They are then about 4 feet high.

Planting.

Cardamoms are planted permanently in the garden at two seasons—from March to June or from September to October. They are usually planted in the same lines as the betel palm and intermediate between two trees. Pits 18″ square and 18″ deep are dug. Part of the excavated earth is returned to the pit mixed with leaf manure, the seedling is planted, and the pit filled up nearly level with leaf manure, but the rhizome and roots should not be deeply planted. The leaves should be supported by one or two bands of plantain bast tied, in the case of each plant, to a stout wooden stake securely fixed upright in the ground. The leaves would otherwise be beaten down by wind or rain. The soil of the *bharan* round each cardamom plant should be regularly dug and weeded. It is asserted that vegetation of any kind does not freely grow under cardamoms. Each plant gets leaf manure in March and April annually if the supply is abundant, otherwise only every second year.

Yield.

The plants are in bearing the year after being planted, but do not yield much the first year. The flowers come somewhat irregularly in April and May. The fruit forms during June and July, and in heavy rain should be protected by a light covering of leaves and branchwood. The capsules ripen irregularly, but mostly in September and October. Those on one scape should be collected as they ripen. They are ripe when they begin to change colour from green to yellow, and at this time should be full and firm. If the capsules are left until fully ripe, they split and shed the seed. Each capsule should be severed from the scape and not plucked. A portion of stalk should be left on each capsule. If plucked, the pressure of the fingers may burst the fruit. The fruit when gathered is dried in the sun for two or three days, and then hand rubbed in the sun to remove the dried calyx attached to the apex of each fruit. The drying should be gradual. Full exposure to the sun may cause the pods to split, and this damages the spice considerably. The capsules lose during dryage considerable weight and bulk. They are during exposure to the sun, to some extent, bleached. When quite dry, the produce is sold to dealers. The price ranges from Rs. 40 to Rs. 75 per maund of 48 *sers*, each of 20 *tolas*.

In a fully stocked betelnut garden there can be 300 to 400 cardamom plants per acre. A well grown, healthy plant may yield up to ½ lb. of dry

cardamoms. But on the average the outturn is much less, often not over 4 *tolas* per plant. Light showers in April and May are favourable to a good crop, but numerous risks attend the cultivation of cardamoms.

Bleaching.

The dealers bleach the cardamoms for certain markets, also sort and pack the produce suitably. The water of a well at Háveri on the Southern Marátha Railway (Dhárwár District) is supposed to have special virtues for bleaching and improving the flavour of cardamoms. Mr. E. C. Ozanne describes the various processes as under:—

"Water from the well is drawn and taken to a suitable room. A large earthenware vessel is filled with the water, into which pounded *antalkái* (the fruit of soapnut, *Sapindus trifoliatus*) and *sikekái* (*Acacia concinna*) in the proportion of 2 lbs. of the former to ¼ lb. of the latter for about 5 gallons of the water are placed and well stirred. Another vessel contains a strong solution of common soap in the water of the well. The mixture containing 2 lbs. of pounded soapnut and ¼ lb. of *sikekái* suffices for 5 maunds (1 maund = 26 lbs.) of cardamoms.

"Two women seated on tripods place a wide mouthed earthenware vessel between them, the washing tub as it may be styled. Eight *lota*-fuls of the well water (a large supply of which is kept at hand) are poured into the tub and three *lota*-fuls of the soapnut or *sikekái* mixture. The *lota* holds about one quart of water.

"The tub then receives a basketful of cardamoms weighing 10 lbs. The two women plunge their hands into the tub and stir vigorously for about one minute and then suddenly rest for about the same length of time, and again stir for another minute. A thick lather results. This completes the first washing. The cardamoms are baled out by hand and transferred to a basket, where they remain a few seconds till the water has drained off. The basketful is received by two other women sitting on tripods with a washing tub between them. This tub contains 7 quarts of the pure water, 1 quart of the soapnut and *sikekái* mixture, and one of the soap solution. The cardamoms are stirred as in the first washing with the same interval of rest, and are baled out into another basket. When the water is drained off, the washed cardamoms are thrown on to a mat. The heap becomes large after a few hours' work. A woman is exclusively in charge of it, and continually sprinkles the well water over it. She is relieved at night by another woman who sprinkles the heap till morning, once every half hour.

"Next day, when the sun has risen, the heap is carried to the flat roof of the house, and the cardamoms are spread on mats for four or five hours to dry. The next operation is to nip off the short stalks. This is done by women sitting in the house. Each woman has a large pair of English scissors. She squats on the floor and rests her right hand which holds the scissors on the floor and feeds the scissors with her left hand. The pace at which this nipping is done astonished me. The stalk is very small, and care must be taken to cut it off without injury to the cardamom itself. I saw an old woman nip ninety cardamoms in one minute.

"This done, the sorting begins. The small ill shapen cardamoms are separated, and only the well-rounded ones packed for export to distant markets. A woman sorts a maund per diem.

"I must now return to the first washing. The mixture in the tub, after the first basketful has been baled out, is replenished by two or three quarts of the well water and a second basketful washed. The tub is then emptied, and a fresh mixture made. The mixture for the second washing also does duty for two basketfuls. The women who wash the cardamoms are paid 3 annas per diem. An ordinary wage is 1½ to 2 annas. The night watcher receives 4 annas. The nipping is paid for by the piece at the rate of ½ anna per *padi* (10 *padis* = 1 maund = 26 lbs.). It is said that an expert can earn 2½ annas per diem. She must clip 13 lbs. therefore; all other hands employed are paid by the day at 2 annas.

Starching.

"Besides this bleaching, nowadays cardamoms are starched. Starching was first introduced at Sirsi, where bleachers had recourse to it, as they had to compete with the bleachers at Háveri, who were experts in the art of bleaching, and who had established their fame as such. The strached cardamoms look whiter than the ordinary bleached cardamoms of Háveri, and the bleachers of Háveri have therefore now taken to starching. The starch is prepared by pounding together rice, wheat, and country soap with butter milk. The paste is dissolved in a sufficient quantity of water, and the solution is sprinkled over the cardamoms to be starched as they are being rubbed by the hand."

Blight.

In the Kánara gardens a so-called disease has appeared in the cardamom crops within recent years, and is undoubtedly now restricting the cultivation. The affected plants do not present any particular indications of disease. They simply become unthrifty. The leaves in parts become yellow, and then these parts of the leaves wither. The effect is that the plants have no vigour of growth. These unhealthy appearances were first noticed locally but now the disease (if disease it can be called) is present in many gardens, and extends over a wide area. It may be taken as certain that the cardamom plant, like any other cultivated plant, degenerates when grown for long periods under precisely the same conditions of soil, climate, and without any change in methods of propagation or reproduction. The vigour of any cultivated plant can be renewed from time to time by change of soil, change of seed, by rotation with other crops, and by other regenerating influences. The Kánara cardamom crops have for a long period been grown without any changes in the system of manuring, propagation, and general cultivation, and I have little doubt but the diseased conditions referred to have been induced by these causes. Within recent years borers and grubs have caused considerable damage, and the cultivators assert as a reason that they have been prevented by forest conservation from usuing for leaf mould the leaves and twigs of certain trees. These trees have astringent properties, and it may be true that leaf mould made from such material would not likely harbour insect life. The grubs cut through the leaves at the base and also cut into the rhizomes. Some of these grubs are identical with the large fat ones which are so commonly found in old farmyard manure. Such manure is commonly used for plants in pots, and if these grubs are present they invariably cut through and cut into the roots of potted plants. A gardener, if he sees a plant withering or unthrifty, removes it from the flower pot, and looks for the grub and destroys it if found. I can suggest no other remedy. The fruit of cardamoms is said to be eaten by snakes, rats, and other vermin.

PEPPER—*Piper nigrum*—Linn.

Natural Order—*Piperaceæ.*

Gujaráti, *Mari*; Maráthi, *Miri*; Kánarese, *Menasu.*

Habitat and general character of the plant.

The commercial product is the dried fruit of a vinelike plant which is found wild in the forests of Malabár and Trávancore. The plant is cultivated largely in Southern India, Siam, Malaya, Cochin-China, and other tropical parts with moist hot climates. A rainfall of 100 inches or more appears to be necessary. The plant is a large climber. The leaves are glossy, acute, cordate. The flowers are pendulous spikes and the fruit red berries, the size of peas in racemes. The berries are fleshy. The pulp covers a soft stone. The plants in climbing cling by adventitious roots very closely to any support. In the Kánara gardens pepper is trained on the *supári* palm trees.

Cultivation.

The plant is propagated by layering or from cuttings. The former is the preferable plan. When the betel palms have been seven or eight years permanently planted, pepper is planted at the roots of the trees. If a long healthy vine from an established plant can be stretched to reach the root of the betel palm, this vine is layered in the leaf-mould manure which surrounds the roots of the palm. The pepper vine takes root freely in this manure, and, when it has done so, is severed from the parent plant and trained on the palm stem. Two or three vines are layered to one palm. The best months for propagating by layering or otherwise are June or July. The young pepper plant grows rapidly. The main vine should branch freely into subordinate vines, so that a number of vines can be trained straight up the palm. They are fully secured to the stem by bands stripped from the sheaths of fallen leaves of the betel palm. The bands are tied about a foot apart, and in well managed gardens are renewed annually at the top and twice a year at the bottom; but in a young plantation a band must be put on from time to time as the vines grow. The main and subordinate vines grow up the tree to a height of five feet or more per annum. Luxuriant growth and free branching are encouraged by heavy applications of good manure given annually for three years after plantation. Subsequently the pepper participates in the general cultivation given to the betel palms, and an application of manure is given for both crops every second year. The manure is heaped over the bared roots of the betel trees and pepper plants in a circle round the stems, and, if plentiful, a big basketful is given to each betel palm, less being given if manure is scant. The basket is saucer shaped, about 3 feet in diameter and 15″ to 18″ deep in the centre. The best manure for pepper, betelnut, and all other crops of the garden, is made from green leaves and twigs plucked or pruned in the monsoon and used as litter in the byres where buffaloes and other cattle stand, and thence removed to a deep manure pit every day or second day with the dung and urine of the cattle. This manure is sufficiently decayed by the following March, and is applied in that month or in April. The pepper plants in an established plantation rise to a height of 15 to 20 feet. Throughout their whole length they send out horizontal branches which are generally about 18″

long. The foliage in healthy plants is from the ground upwards fairly dense, but in an established plantation some of the order vines die. Then the foliage becomes less dense unless the plants are renewed by new layers. A plantation is in bearing three or four years after it is started, and if the old vines as they get worn out are at once replaced by new layers, the plantation should keep in vigorous growth and bearing for a long period. The flowers appear in July and August, and the berries are ripe in March. The yield depends upon liberality in manuring and careful management, also upon the rainfall. The rainfalls of June and July are important, as these cause the plants to produce many flowers; but if the rains come in heavy downpours subsequently, the inflorescence may be destroyed before it fairly sets. If there is a long break after the first rains, the flowers may wither. With light showers, however, a full crop may be expected.

Yield.

The vines on one palm when in full bearing yield in a good season about 1,000 clusters on an average. The clusters vary in size, but 1,000 should yield about 7 *sers* of dried pepper (a *ser* = 24 *tolas*).

Gathering the fruit.

The plants, the flowers, and the fruit are delicate in the sense that they are damaged by rough handling. Therefore, ladders are used when the vines are bound to the palms and the berries plucked. The ladders are straight single bamboos, with the alternate side branches cut off about a foot from the stem. These provide the steps of the ladder. A wooden hook is rigidly attached at the top end of the ladder, and secures it to the palm above the level of the tallest pepper plants. The ladder is slightly inclined in a certain direction when in proper position, and then can be safely used as it cannot well slip. The bunches are plucked by hand and placed in an oblong cane basket slung horizontally behind the workman by a rope round his waist. The rounded ends of the basket project a little on either side, so that the basket can be conveniently filled by either hand of the workman. When plucked, all the berries in a bunch may be equally and fully ripe, but ordinarily the bunches are plucked when the berries are mostly green and just changing in colour.

Preparing for market.

The berries may or may not be sorted as they are plucked. If they are sorted, those fully ripe are separated. These are soaked in water for seven or eight days or heaped, so that the pulp ferments, and then rubbed by hand or on a coarse cloth if the quantity is small, or trampled under the feet of coolies if large. The pulp is thus rubbed off the inner "stone." The stone furnishes the white pepper of commerce. The pulp is completely removed by washing in baskets in running water. The pepper is then dried by exposure to the sun for about a week. This has also a bleaching effect, and the pepper becomes pale grey or pale drab in colour. It can be bleached a whiter colour by chemical agency. This white pepper is only prepared to a limited extent in the Kánara forests. The chief product is black pepper. It is got from unsorted berries which are heaped up for four days. The green berries then get softer and change colour, and the pulp of all is more or less squashed. Then the berries

are spread out and dried. The skin and part of the pulp adhere as a dry, dark coloured, wrinkled covering to the stones, and the pepper is black in appearance. White pepper is worth Rs. 10 to Rs. 11 per maund. Black pepper is worth Rs. 7 to Rs. 8 per maund.

Manures used in Ka'nara Spice Gardens.

The owners of spice gardens in Kánara depend chiefly upon leaf mould for manure. They have never used manure of any other description, and have no faith that ordinary cowdung manure, oil cakes, or other concentrated manures would serve their purpose equally well. They consider that the best leaf mould manure is got from the green leaves and small succulent branches of certain trees which during the monsoon are used as litter under the feet of cattle tied during night and the greater portion of the day in sheds. This litter is freely used, five large head-loads being brought daily for about twelve cattle. The litter having absorbed, the urine and dung is removed daily or every second day, and put in square pits which are generally about 8 feet deep. These pits are dug in situations where they catch the whole direct rainfall, which is very heavy, and possibly also a good deal of drainage water from higher levels. The subsoil is very retentive and there is probably not much drainage through the subsoil from the manure pits, but the contents of these pits must be continuously wet during the monsoon. For each acre of garden an owner would like to have four cattle. He owns always a milch buffalo or buffaloes, but keeps no work cattle as all the garden labour is manual. If he does not own sufficient cattle, he hires them, feeding them gratis for the value of the manure produced. The hiring of cattle is a common practice. They are chiefly fed on dry grass which is of very inferior description. They probably also eat part of the litter as some of the leaves used are liked by cattle. Milch buffaloes get safflower cake or cotton seed, both imported from Hubli (Dhárwár District), and it is rather significant that the gardeners think leaf mould got from buffalo litter is best for manure. Some owners feed cotton seed or cake to all their cattle in the monsoon, and I have no doubt they find it pays to do so, because ordinarily the cattle are, during this season, miserably thin and unhealthy. Many cattle are brought in from Dhárwár, but only survive a few seasons in the feverish climate of Kánara.

In the fair season the cattle get a good deal more freedom, still they are kept in the sheds for probably about fifteen hours in the twenty-four, and the sheds are littered freely. The rough grass is supposed to be given as fodder, but is spread all over the floor in the sheds, and the cattle eat only a small proportion of it. Again, at this season dry leaves are collected and also used as bedding. But the gardeners think dry fallen leaves poor stuff, and discount the value of such as manure. The manure put in the pits in the hot weather has a full year to decay, the manure being used always in February and March. That which is made during the monsoon has less time to decay, and the gardeners attach particular value to the green leaves and twigs of certain trees collected during the monsoon, because such decay very quickly. Such leaves are generally large and fleshy, and are much more easily collected than smaller ones. A man can

collect and carry to the cattle shed five head-loads per day. The leaves and branches of other trees are also held in high esteem for leaf mould, because the manure produced has the reputation of destroying insects and grubs which would be harmful to the plants in the garden. The trees which provide leaves of the latter class have all unquestionably astringent properties, and it is perhaps reasonable to believe that vegetable matter containing astringent resins or volatile oils might destroy insect life or that insects would not be likely to harbour in such material. The gardeners assert that since they have been denied the use of the leaves of certain reserved trees, grubs and borers have become destructive to their cardamom plants and betel plams, these insects causing damage first at the roots.

It is impossible for me to say what weight of manure is actually applied per acre. But, judged by the eye, I think it is certain that the application is at least equal to a heavy dressing for ordinary garden crops. It probably approximates thirty ordinary cart-loads per acre per annum, perhaps more.

The invariable practice is to put the leaf mould immediately over the roots round the stems. The circle would be 3 or 3½ feet in diameter. It is urged that the leaf mould, if unprotected, would be washed away by heavy rainfall, and this is perhaps true, and in consequence a good deal of branchwood cut green in the hot weather, so that the leaves adhere, is used to cover the leaf mould. The branchwood which is most desirable is such as will slowly decay and has astringent properties, *i.e.*, has the power of keeping destructive insects away. The brances of *jambe (Xylia dolabriformis)* and *nelli (Phylanthus emblica)* have the two qualities referred to in a special degree. The branchwood used does not readily decay. It affords considerable protection to the leaf mould. A year after it is applied the leaves have decayed, and the branches are partly rotten, still they would break the force of heavy rain. It might be urged that a covering of soil over the leaf mould would be sufficient protection, especially as the soil of these gardens is of a decidedly adhesive character. It is possible that this adhesiveness would tend to exclude air and moisture from the leaf mould and prevent it serving its purpose as manure. But I do not believe such would be the case. At Bassein in the Thána District, with a rainfall as heavy as that in Kánara, the manure given is put round the roots of the plantains, betel vines, and other crops, much in the same way as in Kánara, and protected by a covering of soil. The soil is, however, a light alluvial sand, and the manure is not washed away. The manure used at Thána is cowdung manure and castor cake, chiefly the latter, and it is given in several applications every year. The question is, can a manure of this class be economically substituted for a portion at least of the very heavy and very expensive dressings of leaf mould now applied? I consider that the leaf mould manure is expensive, even although its production requires only labour in collection and the keeping and feeding of cattle.

Castor cake and safflower cakes are produced on a large scale in the Dhárwár District, and are obtainable at very moderate rates by the Kánara gardeners. It might, therefore, be advisable to experiment with these manures and prove their effect.

Forest Lands assigned to Gardens.

The more common trees in *beta* lands and in protected forest, which are specially useful to the cultivators for manure purposes, are referred to in short detail below :—

Kaval or Kavla (K.) (Careya arborea).—Leaves big, fleshy, soon rot as green manure, and considered specially good for leaf mould. Trees abundant in *beta* lands.

Honne (K.) (Pterocarpus marsupium).—Leaves are rather small, and are not considered particularly good for leaf mould. The leaves are excellent fodder, and this probably is the principal reason why leaves are taken. Tree yields a gum used in medicine and which is largely exported.

Jambe (K.) (Xylia dolabriformis).—Used more as a covering for the leaf mould manure as light branchwood than for leaf mould. Does not decay quickly. Yields a red resin, and probably on this account the wood resists ants and other vermin. Heartwood very hard. Timber used for carts and other agricultural implements and for furniture, etc.

Hirda (M.), Alate (K.) (Terminalia chebula).—The best leaves of all for green leaf mould. Supposed to kill insects and grubs. Leaves small and do not rot very quickly. Tree yields a gum used in commerce. Dried fruit yields a dyeing and tanning material. Oil in kernel of fruit. Fruit used medicinally in many ways. Leaves eaten as fodder by cattle. Wood hard, close grained, durable, seasons well, used for furniture, implements, etc.

Kanagal (K.) (Dillenia pentagyna).—Leaves are good for leaf mould. They are very large and fleshy, and decay very quickly. Flowers, buds, and fruit eaten. Berries eaten greedily by deer and other animals. Wood not much used except for firewood or charcoal.

Honal (K.) (Terminalia paniculata).—Considered nearly as good as *matti* for leaf mould. Leaves not large and do not decay particularly quickly. Bark and fruit said to be used for dyeing and tanning. Wood useful for many purposes.

Matti (K.) (Terminalia tomentosa).—Leaves and branches considered excellent for leaf mould. Leaves large and easily collected. The bark of *matti* when burnt leaves an ash which consists mostly of calcium carbonate, and this lime is used with betel leaf (*pán*). Yields a gum reddish brown with bitter disagreeable taste. Bark used for dyeing and tanning. Leaves used as cattle fodder. Wood useful for many purposes.

Nerlu (K.) or Jámbhul (M.) (Eugenia jambolana).—Used to a considerable extent for leaf mould or for branchwood; used as a covering over leaf manure. Yields a gum. Bark used for dyeing and tanning. Wood not much used for anything except firewood.

Bite (K.) (Dalbergia latifolia).—Blackwood. Reserved as a valuable timber tree.

Nelli (K.) (Phyllanthus emblica).—Fruit, bark, leaves, all used for tanning. Used medicinally; contains gum. Branches used as protective covering for young cardamom seedlings. Fruit and leaves good fodder. Wood used for building and agricultural implements.

Surhonne (K.) (Callophyllum tomentosum).—Sirpoon tree. Evergreen tree. Yields a black gum. Seeds yield oil, tree tall, straight, and used for masts and buildings. Found in *kâns*, not in *beta* lands or protected forest.

Kari muttala (K.) (Ougeinia dalbergioides).—Yields an astringent red gum. Leaves used for fodder. Bark astringent and used to poison fish. Tree small, otherwise would yield timber suitable for many purposes.

The collection of green leaves and branches in forests discussed.

It will be noticed that the unreserved trees which are reported to give the most useful leaves and branches for garden requirements have no great value as timber trees. The pollarding practised unquestionably shortens the life of trees. It will also diminish their fuel value when dead, because they have spent their substance in producing by unnatural treatment leaves and small branches instead of natural growth. The result justifies the means, because small branches and leaves are specially required by the gardeners. A large, well-balanced tree with straight stem, shapely limbs and dense foliage carries, no doubt, a wealth of leaf growth that a Kánara gardener would like to collect. But how is he to do so? He could manage it by dismembering the trees and getting the big branches on the ground. This is practically what he does when he first pollards and lops. Afterwards the foliage (it is cut every second year) is within easy reach and for a number of years a large amount of foliage and light branchwood is produced. In course of time the tree dies prematurely by exhaustion or ill-health induced by bad usage; but if young trees of suitable variety are so protected that they replace old decayed trees, and if pollarding is prohibited until young trees attain certain dimensions, as proposed by the Committee in the draft rules, then I think the interests of Government will be fully safeguarded, and the requirements of the gardens fully maintained. I saw numerous instances of well managed *beta* lands. I saw also instances of ruthless destruction with the surface burnt to encourage grass, and no forest undergrowth to speak of, but side by side with these badly managed *beta* lands there was even greater destruction in protected forest, for which the people at large, and not the garden owners alone, were responsible.

Dead leaves not so good as green leaves.

It has been suggested that the full requirements of the garden occupants could be met if they gathered dead leaves and grass in enclosed forest to supplement the supplies of green leaves and twigs got from assigned *beta*. It is also urged that the dead leaves and grass would not be less valuable for manure than green leaves and twigs. I cannot support these views. Leaves, as they become perfected, dry up and become fibrous, and a good deal of the plant-food, both mineral and organic, which they contained when green and growing, passes from them, and is utilized in increasing the size of the stem or branches and in perfecting the fruit. There can be no question at all, therefore, as regards the superiority for manurial purposes of the green leaves of a particular tree over the dead leaves from the same tree.

The dead leaves fall, moreover, at a particular season and have to be collected at that particular season ; otherwise they soon become incorporated with the soil and disappear. If put in deep pits they would in the course of a year decompose into what is known as a leaf mould by gardeners. This material would, in my opinion, have inferior manurial value to the manure now used.

Dr. Leather's analyses of various leaves.

I am convinced that such would be the case from the results of analyses by the Agricultural Chemist to the Government of India of the various descriptions of green leaves and small twigs ordinarily used. I sent him the leaves and twigs of eight different varieties of trees, the varieties being such as are considered best for leaf manure. The analyses are appended below :—

	Kaval Leaves (*Careya arborea*).	*Ippi* Leaves (*Bassia latifolia*).	*Honne* Leaves (*Pterocarpus marsupium*).	*Jambe* Leaves (*Xylia dolabriformis*).	*Hirda* Leaves (*Terminalia chebula*).	*Kanagal* Leaves (*Dillenia pentagyna*).	*Honal* Leaves (*Terminalia paniculata*).	*Matti* Leaves (*Terminalia tomentosa*).
Moisture ...	80·66	78·95	78·77	73·31	77·77	87·06	75·06	81·86
Dry matter ...	19·34	21·05	21·23	26·69	22·23	12·9	24·94	18·14
Organic matter ...	18·00	19·60	19·58	25·24	20·90	11·68	23·42	16·74
Mineral matter ...	1·34	1·45	1·65	1·45	1·33	1·26	1·52	1·40
Silica ...	·08	·10	·12	·11	·04	·08	·12	·07
Potash (K_2O) ...	·43	·43	·53	·44	·30	·41	·40	·44
Phosphoric acid (P_2O_5) ...	·086	·097	·095	·08	·078	·070	·100	·080
Nitrogen ...	·31	·43	·54	·62	·40	·24	·42	·34

The manurial value of the leaves compared with farmyard manure.

The leaves and twigs contained from 73 per cent. to 87 per cent. of water. But even in this succulent condition the percentage of nitrogen and potash (the two most important elements of plant food) were equal to about half the quantities usually found in well preserved farmyard manure. The air-dried material of these leaves and twigs would be considerably richer in nitrogen and potash than air-dried well preserved cattle manure. The leaves and twigs are all deficient in phosphoric acid. The contention of the gardeners that certain leaves are better manurially than others is not supported by the analyses. *Hirda* leaves are considered locally very superior for leaf manure, also those of *matti* and *honne*. But the analyses show that other varieties are superior to these for manure purposes: On the other hand, it is fair to state that the leaves of *hirda*, *matti* and *honne* are considered specially valuable, because the manure produced from them destroys insects and grubs which would be harmful to the plants in the garden. These leaves and, in fact, nearly all the leaves used by the gardeners have astringent properties, and it is, I think, certain that vegetable matter containing astringent resins or volatile

Leaf manure specially valuable for certain reasons.

oils would be obnoxious to insects, and therefore insects or grubs which might be harmful to the plants of the garden would not harbour in such material. Dry leaves, unless collected soon after they have fallen, undoubtedly harbour insect life, and this is one serious objection to their use as manure. I was hopeful that the Agricultural Chemist would be able to state definitely how far the various leaves and twigs submitted for analyses differed in astringent properties. He was, however, unable to investigate this point. I took no samples of dead leaves, because at the time of my visit to Kánara—April—it was impossible to collect samples which could be identified as belonging to any of the particular trees from which green leaves are usually taken. In fact, dead leaves had mostly disappeared by that time. I believe they mostly fall in December-January, and could not, except in trifling quantity, be collected during the monsoon when green leaves and twigs are ordinarily collected as manure. Dr. Leather's analyses clearly indicate that manure of good quality can be made from the green leaves and twigs ordinarily used. The system of trampling the leaves under the feet of cattle, so that the urine and solid excreta are absorbed, would improve the quality of the manure particularly if the cattle are fed partly on cake as is sometimes the case. The storage of manure in deep pits formed in soil and subsoil, which is very retentive, can hardly be improved upon, excepting that the extremely heavy rainfall of the district must keep the unprotected pits excessively wet during the monsoon, and probably valuable manurial ingredients are washed out of the manure at this season.

Dr. Leather's analyses of leaf manure.

I submitted to the Agricultural Chemist to the Government of India four samples of manures. Each sample is sufficiently described in the tabulated statement below:—

	Monsoon green leaf-manure. Sample taken from roots of trees to which it was applied in February 1898.	Green leaf-manure as applied to Betel-palms, February 1899. Sample taken in April 1899.	Dry Leaf-manure made from dead leaves used as litter under cattle fed on grass, etc.	Manure made from green leaves collected in the rains and used as litter under cattle.
Moisture	55·07	58·05	56·90	59·72
Dry matter	44·93	41·95	43·10	40·28
Organic matter	23·44	28·74	25·42	26·48
Mineral matter	21·48	13·21	17·68	13·80
Sand	14·69	7·80	11·43	7·47
Potash (K_2O)	·16	·41	·43	·17
Phosphoric acid (P_2O_5)	·14	·18	·12	·17
Nitrogen	·51	·51	·55	·75

The comparative manurial values of the different samples compared.

It is difficult to understand the deficiency of potash in the fourth sample. The nitrogen and phosphoric acid are probably about average for this kind of manure. Samples Nos. 1 and 2 were originally of similar class to sample No. 4. They were, I imagine, superior in quality originally to No. 4. The Kánara system is to apply manure every second year. No. 1 sample (taken in handfuls from many trees) is by no means exhausted fourteen months after application, and it may be inferred from this that the gardener's methods of application and of protecting the manure from surface wash and heavy rainfall by a covering of branchwood and leaves are successful in practice. From personal observation I can say that the branchwood, a full year after being first put on, is sufficient to break the force of heavy downpours of rain, and when first put on or afterwards allows the rainfall to percolate through the manure to feed the plants. It is suggested in the papers by one officer that the gardeners should use the leaf sheaths of the *supári* palm leaves as a protection for the manure instead of the branchwood now used. The leaf sheaths are all required for another purpose in the garden economy, and in any case the manure does not (as Mr. Davidson points out) need a water-proof. It needs protection and needs also to soak up the rainfall, as it falls, in a fair and reasonable way. No. 2 sample was taken in the same way as No. 1 in handfuls from above the roots of many trees. The samples were taken two months after application. No. 2 contains less sand than No. 1 for obvious reasons, and probably its original manurial elements had been since application utilized to considerable extent, as the trees and plants were in active growth. The garden soil and the manure were quite moist, and there had been abnormal, rather heavy, rainfall some little time before the samples were taken. These are conditions which would help the plants to utilize the manurial ingredients quickly. The sample No. 3 from dry leaves used as litter under cattle is quite as good as might be expected. It has about half the manurial value of good cattle dung manure. The owner considered it was poor stuff. The high percentage of sand is noticeable.

The present system of manuring successful in practice.

There is no doubt that the present system of manuring in the Kánara gardens is successful in practice, provided the gardeners are allowed to use in sufficient quantity the kinds of forest produce which they prefer. The system of manuring is expensive, even though the materials are got free, and the destruction caused to forest growth is enormous. Under the circumstances, it would, I think, be most advisable to test by experiment whether available concentrated manures, such as castor cake or safflower cake, could take the place of a portion of the manure now used. These cakes can be imported from Dhárwár at reasonable rates into the district. Castor cake is less valuable manurially than safflower cake, and is dearer. In the gardens of Bassein, with heavy rainfall in light soil, castor eake is successfully used. It ts obnoxious to insect life, and if used in the Kánara gardens there would probably be less damage done by grubs and borers which certainly do considerable damage to the garden plants and trees now.

Dr. Leather's analyses of Kánara garden soils.

I append hereto analyses by Dr. Leather of samples of four descriptions of soils which are sufficiently described in the appended tabular statement:—

	Kágadáli earth, *e.g.*, the earth excavated from embankments and carried in head-loads to renew the garden soil of old-established garden when renewal is required.	Earth from rice-beds near a thriving spice garden and similarly situated to the garden and presumably capable of being converted into garden.	Soil from old-established gardens.	Soil from new extension of an old garden.
Lime (CAO) total ...	·11	·09	·15	·19
Magnesia (Mg O) total ...	·30	·30	·29	·38
Alkalis total ...	1·07	·31	.....	.....
Potash total ...	·154	·071	·110	·27
Potash (K_2O) available ...	·003	·008	·004	·005
Phosphoric Acid (P_2O_5) total	·086	·04	·073	·074
Do. available ...	.001	·0017	·0005	·0015
Nitrogen total ...	·014	·20	·09	·18
Nitric Acid (as Nitrates) ...	·0009	*Nil.*	*Nil.*	·003

Dr. Leather says the samples are all deficient in lime, phosphoric acid, and more or less so in available potash. I should, as a matter of fact, class them as agriculturally poor; but in my extended notes regarding the garden cultivation I remarked that it does not matter much whether the garden soil is naturally fertile or not, because the yield of the crops is mostly affected by the quality and quantity of manure given. As regards the soil, it must be of such consistence that it withstands the denuding effect of flood water, and be so retentive of moisture that little or no irrigation is required in the fair season. All the samples submitted to Dr. Leather possessed these desirable qualities. It has been already shown that the leaves and twigs used by the cultivators are rich in potash and also in nitrogen, in which the soils are decidedly deficient. It has also been shown that the trampling of the leaves under cattle and the absorption of the excreta particularly, if the cattle are partially fed on cake, improves the resultant manure in phosphates. Dr. Leather has not separately estimated the amount of lime in the manures, but he shows that the soils are deficient in this important ingredient. I have already stated that the *matti* tree when burnt leaves an ash rich in lime, or, according to local opinion, it yields *chunam*. The cultivators are specially anxious to be allowed to take the leaves and twigs of this tree. If the manure applied to the trees in the Kánara gardens was mixed, as in common agricultural practice, freely with the soil, then the soil in old established gardens would probably be richer in manurial ingredients than new soil. I conclude from a study of Dr. Leather's analysis that the system of manuring, as practised in the gardens of Kánara, is as right in theory and practice as it well can be, provided the manure as it accumulates in the pits is subjected in the least possible degree to the wasteful wash of the heavy Kánara rainfall.

INDIGO—*Indigofera tinctoria*—Linn.

Natural Order—*Leguminoseæ.*

Sub-order—*Papilionaceæ.*

Tribe—*Galegeæ.*

Maráthi, *Nili*; Gujaráti, *Gali*; Kánarese, *Nili.*

Habitat.

Various forms of *indigofera* are found wild in various parts of India. Dr. Watt says there are about 300 species of *indigofera* in the tropical parts of the globe and chiefly in Africa. India has about forty species. He doubts whether *I. tinctoria* has ever been found wild in India. The supposed wild forms of *I. tinctoria* found in India are not far remote from places where it is cultivated.

I extract from Duthie and Fuller's botanical description as under:—

General character of the plant.

A small shrub, 4 to 6 feet high, with silvery pupescent, tough, angular branches; leaves alternate 3 to 4 inches long with minute subulate stipules unequally pinnate; petiole ½ to 1 inch long; leaflets opposite in pairs of four to six and a terminal one, shortly stalked, obovate oblong or oval, entire, smooth, bluish green above, and with adpressed white hairs on lower surface. Racemes stalked, axillary, erect, spikelike. Flowers small, short stalked, rather crowded. Pods 1 to 1½ inches long, straight or sub-falcate, cylindrical, somewhat contracted between seeds, 8 to 12 seeded, seeds quadrangular, brown.

Distribution in Bombay.

Indigo is now very sparingly cultivated in the Bombay Presidency. In former times it was extensively grown in Gujarát, and the ruins of steeping vats can be seen in many villages. Cheaper analine dyes have been largely substituted in India for those of vegetable origin, hence the decline of the indigo industry in Bombay. The indigo area in Bombay varies from 2,000 to 3,000 acres annually. The chief centres of cultivation are Khándesh, Broach, Kaira, Ahmedabad, Ahmednagar, Sholápur and Dhárwár.

Soil and season, etc.

In Gujarát the best crops are grown on *gorádu* soil (deep, sandy, loam alluvium). In the Decean medium black soils of fair depth are most suitable. The crop is grown in the *kharif* (rainy) season in Bombay.

Cultivation in Gujarát.

Thorough tillage and a liberal application of manure are necessary. Well rotted manure in a dressing of twenty cart-loads per acre should be given in May. The plough and harrow should be used after the first fall of rain to prepare a clean, smooth seed bed.

The crop is either sown alone or with subordinate rows of cotton. One row of cotton alternates with two rows of indigo. When sown alone, the seed rate is 12 to 15 lbs. seed per acre. The seed should be drilled if possible in June in rows 18″ or less apart, and the drill should be worked near the surface, so that the seed is not buried too deeply. The crop should, after the seedlings are well up, be intercultured two or three times with the bullock hoe, and be once hand weeded with the weeding hook

(*khurpa*). The first cut is ready in September-October. With favourable late rain, a second cut may afterwards be obtained without irrigation.

Harvesting and extracting the dye.

The crop is reaped close to the ground with a sickle immediately before flowering The plants are reaped in the morning, and carried to the vats in the afternoon. The dye is obtained from the leaves. These are sometimes sun dried, stored, and the dye extracted at any convenient season afterwards. Loss of dye matter is caused by exposure to rain.

Fermentation.

The first process of dye extraction is to pack the newly cut crop in the fermenting vat which is 4 to 5 feet deep. Water is then let in until it fills the vat. The mass is weighted down with logs. Next morning the muddy looking extract is drained to a vat at a lower level, and the spent stalks removed. The fermentation of the stalks and extraction of dye material in the first vat should take thirteen or fourteen hours and less time in warm weather. The quality of the dye is lowered if the time allowed for extraction and fermentation is unnecessarily prolonged. The proper time to empty the fermenting vat is when the mass begins to shrink. At first it heaves and increases in volume, then gradually shrinks.

Oxidation.

The muddy extract, after it is run into the oxidizing vat, is trampled and beaten with paddles or sticks to expose it as much as possible to the action of the atmosphere, the effect of which is to change its dull green colour to a deep blue. Subsequently, after settling and rest for twelve hours, the supernatant water is removed with some degree of care in earthen vessels, but the sediment being thus agitated, considerable loss occurs. It is the custom in some places after the spent stems have been removed to leave the extract in the fermenting vat until oxidation and settling is completed as described.

Preparing the dye for market.

The indigo made in Gujarát is impure and only suited for sale to country dyers, principally because it is not cooked as is the practice in the factory system. It is merely drained free of water, and hung up on trees in bags to dry, the usual practice being to place the thickened mass of precipitate on a sheet suspended by its four corners, so that the edges are slightly raised from the ground. After exposure and draining for a day, the corners of the sheet are tied up, and the mass suspended clear of the ground to complete the draining. When nearly dry, it is spread on a clean floor, and when of proper consistence cut into cubes or shaped into small conical *golis*, and is now ready for market.

Outturn value.

The first crop yields 25 to 30 lbs. of indigo, worth Re. 1 to Re. 1-4 per lb. The cost of manufacturing this quantity comes to about Rs. 8. The second crop is reaped in November-December. The yield is less than the first crop and the dye inferior. The second crop is generally dried, and the leaves stored. A dealer generally buys the crops produced by several cultivators. The dried leaves are worth Rs. 2 to Rs. 2½ per local maund (38½ lbs.). The extraction of the dye is undertaken by Dheds and other low-castes. Kunbis, Kolis and other good agriculturists do not grow the crop, and the cultivation accordingly suffers.

Indigo refuse is a good manure.*

* The description is principally derived from notes supplied by Mr. P. R. Mehta, M.R.A.C., of the Gujarát Revenue Survey.

Cultivation in Northern India.

In the North of India recently constructed canals have offered facilities for irrigating the crop, and, in consequence, the prevailing custom is to broadcast the seed in spring 16 lbs. per acre on a well prepared seed bed. The first cut is ready in August. A good crop yields 8 to 10 tons of green produce per acre, from which 50 to 60 lbs. of marketable dye can be prepared. Cloudy wet weather about the time the crop matures lessens the quantity of dye matter formed in the leaf. Spring sown indigo may be seriously damaged if the monsoon rains are late. It is not usual to take a second cut unless the crop is saved for seed. The more common practice is to grow wheat or barley as a second crop in the same year, the land being again prepared for indigo by repeated ploughings, usually three to five as soon as the cereal is harvested. Indigo sown in June is sometimes ratooned in the following year, when, if the land is clean and otherwise liberally managed, a better crop than the first is often obtained.

The factory system.

I take the following very clear description of the factory system from Duthie and Fuller's "Field and Garden Crops":—

Fermentation.

The essential parts of an indigo factory are—(1) two sets of vats, one on a lower level than the other, the upper set being used for steeping the plant, and the lower for concentrating the dye matter; (2) a boiler and a furnace for boiling the dye; (3) an apparatus for straining and pressing. The size of the steeping vat varies, but it is usually large enough to contain from 50 to 100 maunds of plant. The plant is packed into the vat which is then filled with water, the plant being kept submerged by some cross bars which are fitted across the vat above it. The time during which this steeping continues varies according to the weather from eleven to fifteen hours, being less in muggy damp weather with the wind in the East than when the air is dry with the West wind. It is of great importance, however, that the steeping should be stopped at the right moment; if underdone dye matter is lost; and if unduly prolonged, the quality of the produce suffers. The steeping vats open by a channel into the vat which corresponds with it in the lower tier. When the steeping is finished, a plug is drawn, and the water drained off into the lower vat, leaving the plant behind it, which can be then thrown aside. The water is of a greenish colour, and is charged with a substance known as indican which fermentation has extracted from the leaves. In order to convert this substance into indigotine—the basis of indigo dye—it is necessary to oxidize it, and the next process known as "beating" has this for its object. Usually it is performed by seven or eight men who stand in the water and agitate the liquid either with their hands or with a rake-shaped paddle. As the oxidation proceeds, dark blue particles of indigotine (known collectively as the *fecula*) appear in the liquid which changes in colour from green to blue. The process is continued for from one and-a-half to three hours, and may be stopped as soon as a little liquid placed in a saucer readily throws down a dark blue precipitate, remaining itself of a clear sherry tint. It is now allowed to stand until the *fecula* has settled, which takes place in about a couple of hours, and is sometimes assisted by pouring some cold water into the vat. The surface liquid is then carefully drained out of the

Oxidation.

vat by holes which have been made in its walls for the purpose, and the dark blue sediment which remains is conducted along a masonry channel into the boiling vat, where it is kept over a moderate fire for about five hours, and is then repeatedly passed through a cloth strainer which effects the separation of the dye matter from the water.

Cooking.

The dye matter is then allowed to lye on the strainer until partially dry when it is carried to the press and placed in boxes with moveable sides, in which it is subjected to gradually increasing pressure for twelve hours, at the end of which time it will have taken the form of firm slabs, 3½ inches square, which are then cut into cakes of the same length, and are ready for being stamped and finally dried. The whole process from plant to cake occupies, therefore, about 48 hours, and at a large factory one follows the other in constant repetition for some 45 days in August and September.

Pressing and stamping.

Good indigo cake should contain 50 to 60 per cent. of indigotine. It should be bright, of a dark blue colour with a coppery gloss breaking with an evenly coloured fracture. It should not part with its colour by light friction.

Indication of good quality.

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which these rhetoricians introduced, was more fatal to truth and justness of sentiment than even the florid exuberance of Cicero and his imitators. The habit of estimating logical arguments by the accessories of style alone soon leapt from the schools to the tribunals. The noblest of the Romans, accused of plunder or extortion in the provinces, and assailed with virulent licence of tongue as a thief or brigand, could reply, not by refuting the charges with evidence or reason, but by curiously poising them in a balance of antitheses, and receive, if not his acquittal, that which perhaps for the moment he valued higher, the admiration and applause of his judges.[1]

Conventional rules for the declaimers.

A glimpse of this curious fragment of Roman literary life may leave a feeling of wonder, not unmixed with pity, at the exuberance of animal spirits fostered by the training of the Campus and Palæstra, which found a vent, in the silence imposed on serious and sober thought, in vociferating conceits and puerilities with all the force of the lungs, and the by-play of attitudes and gestures. If the subject of the debate was merely moonshine, if its *schemes* and *colours* and *sentences* were in a great degree conventional, yet the manner, the movements, the arrangement of the dress, the management of the voice, all these came more and more to take the place of real meaning and purpose, and were subjected themselves to rule and rigid

three to retain. The lines, on being produced, were found to be *the same*. Two of them are mentioned: "Semibovemque virum, semivirumque bovem," was one; "Egelidum Boream, egelidumque Notum," another. I think Ovid was right. It is added; "Aiebat interim decentiorem faciem esse in qua aliquis nævus esset." I am inclined to agree with him again. The saying is very characteristic. For historical anecdotes I may refer to those about Cicero, Cremutius Cordus, and other celebrated personages.

[1] Persius, i. 85.:

"Fur es ait Pedio; Pedius quid? crimina rasis
Librat in antithetis; doctas posuisse figuras
Laudatur."

censure. The hair was to be sedulously coifed; directions were given for the conduct of the handkerchief; the steps in advance or retreat, to the right hand or to the left, which the orator might safely take were numbered. He was to rest so many instants only on each foot alternately, to advance one so many inches only before the other; the elbow must not be raised above a certain angle; the fingers should be set off with rings, but not too many, nor too large; and in elevating the hand to exhibit them, he must be careful not to disarrange his head-dress. Every emotion had its prescribed index in the gesture appropriated to it. The audience of scholars and amateurs who crowded to these private theatricals, applauded with intense enthusiasm not the passion nor even the conceit so much as the correctness of the pantomime. From the schools all these conventions were transferred to the tribunals; and a century after Augustus, a judicious professor of the art of speaking, could devote several pages of his elaborate treatise on the Institution of an Orator to the discussion of these and many other points of etiquette in dress, manners, and attitude.[1]

General purity and terseness of style in the Augustan writers.

The pernicious effects of this solemn trifling seem to have perverted the moral sense of the Romans more speedily than even their literary style. Itself the creation in part of an era of hollow pretensions, it reacted still more powerfully upon it, and produced the tone of insincerity which pervades the monuments of its mind and intellect. Yet it was long before it affected that justness of thought, that purity of taste, and that accuracy of diction which distinguished the

[1] Quintilian, *Inst. Orat.* xi. 3. His examples are in a great measure derived from the usage of Cicero, and even Demosthenes; and it must be admitted that the physical accessories of oratory were studied with a care which was not altogether superfluous in the best ages of Greek and Roman eloquence.

compositions of the Augustan age; and it must be remembered that the declaimers themselves, of whom mention has been made, were of the same generation as the men who could cheer with correct discrimination a Livy, a Virgil, and a Horace. Seneca himself was not unconscious of the meanness of his art, and contrived to keep his language but little corrupted by the conceits with which he burdened his memory. The purest master of Latin prose we possess, the illustrious Titus Livius, was himself a frequenter of the schools, and, perhaps, even a professor of rhetoric.[1] If his style escaped the contagion of such evil influences, if his judgment and fancy retained their well-adjusted balance, he may still have lost in that baneful atmosphere the clear perceptions of truth and candour, and the abiding sense of moral obligation, which should hold sleepless vigil round the desk of the historian. Devoid of these, the passion for liberty is as rank a perverter of justice as the meanest servility; the truth of history was sacrificed as much by the few indomitable spirits who still thundered against tyranny, as by the supple flatterers who painted the tyrant in the colours of a patriot and a demigod. If we possessed the Annals of the surly republican Labienus, we should doubtless find them no more to be relied on than the panegyrical biographies of the courtier Nicolaus. It is mentioned as a proof of the freedom with which Labienus had lashed the crimes of the great and powerful, that in reciting to his friends, he would sometimes roll up whole paragraphs of the volume, saying, *What I now pass over will be read after my death.*[2] But the man who writes, under

Titus Livius.

[1] This may be inferred, perhaps, from comparing Senec. *Epist.* 100. —"Scripsit enim et dialogos, quos non magis philosophiæ annumerare possis quam historiæ, et ex professo philosophiam continentes libros"—with Quintil. *Inst. Orat.* viii. 2. 18., x. 1. 39., and Suet. *Claud.* 41.

[2] M. Senec. præf. *Controv.* v.: "Memini aliquando cum recitaret historiam magnam partem convolvisse et dixisse, hæc quæ transeo

such circumstances, for posterity what he dares not divulge to his contemporaries, subjects himself to a temptation to gratify malice by calumny, which few can withstand, and which none should venture to disregard.

Character of Livy's history.

It was in the schools, we may believe, that Livy learnt that indifference to historical accuracy, that sacrifice of the substance to the form of truth, which has cast a shade over the lustre of his immortal work. As a friend of the ancient oligarchy, and an aristocrat in prejudices and temper, he would scarcely have carried his Roman history down to his own times, had he not submitted to veil his real sentiments, and made his book such as Augustus himself might sanction for the perusal of his subjects. The emperor, indeed, is said to have called him a Pompeian, and to have complained of the colours in which he portrayed the men of the opposite side; but this could only have been in jest; the favour in which he was held by the courtiers of the empire, and his being suffered to assist the studies of Claudius Germanicus, show that he was not seriously regarded as a disaffected politician.[1] The scorn which Livy heaps on the tribunes and demagogues, and his ignorant contempt for the Plebs, evince the leaning of his mind to the side of the nobility. But these are obviously the views of the rhetorician rather than of the historian; and Augustus, tribune and demagogue as he was, could distinguish between the hollow commonplaces of a perverted education and the stern judgment of genuine conviction. The loss

post mortem meam legentur." His books were burnt by a decree of the senate. Cassius Severus said: "Nunc me vivum uri oportet, qui illos edidici."

[1] Tac. *Ann.* iv. 34.; Suet. *Claud.* 41. Nevertheless, in the preface to his work, Livy alludes with deep feeling to the misery of the times he had witnessed, and his presentiment of national decline—"Hæc tempora quibus nec vitia nostra nec remedia pati possumus"—must have been highly unpalatable to the reigning powers.

of the latter portions of this extensive work must be deplored for the number of facts it has swept into oblivion; but the facts would have been valuable rather from the inferences modern science might deduce from them, than from the light in which the author would himself have placed them. Livy, taking the pen in middle life, and continuing to pour forth his volumes in interminable succession, perhaps to the end of his long career,—for born in the year 695, he died in 771—left it still apparently unfinished, at the close of his hundred and forty-second book, and with the decease of Drusus Germanicus.[1] It may be conjectured that the latter portions of the work were overtaken by the garrulity of old age, and were suffered to fall into oblivion from their want of political or literary value.[2]

The service Livy performed for his countrymen.

It is in the earlier books, however, that the spirit of Livy found its most congenial sphere; the first and third decades, containing the early history of the kings and consuls, and again the grand epic of the war with Hannibal, have

[1] Niebuhr's remarks on the dates of Livy's history (*Rom. Hist.* iv.) may be compared with the more common view given in Smith's Dictionary and elsewhere. I think the beginning of the work must be placed in 725—730; but adopting the idea that it was originally divided into decades, the fact, now demonstrated, that it reached to a 142nd book, seems to show that it was not left complete according to the author's intentions. It is also well remarked that the death of Drusus does not furnish a point of sufficient importance for the termination of the great epic of Roman history. This view is supported by the interesting statement of Pliny, that in one of his latter books Livy had declared: "Satis jam sibi gloriæ quæsitum; et potuisse se desinere, nisi animus inquies pasceretur opere." Plin. *Hist. Nat.* præf. A period of more than forty years thus devoted to the elaboration of a single work is not unparalleled. Froissart was engaged forty years upon his Chronicles.

[2] We have sustained undoubtedly a great loss in the characters of the chief men of later Roman history, such as Livy so frequently inserted into his narrative, and of which we have one fine example in the fragment on the death of Cicero. The ancients declared him, "Candidissimus magnorum ingeniorum æstimator." M. Senec. *Suasor.* 7.

always retained their preeminence in general esteem as the noblest specimens of narration. The greatest minds of Rome at this period seem to have kindled with inspiration from the genius of the founder of the empire; and of these Livy at least appears to have conceived unconsciously the idea of attaching his countrymen to the early records of their city, by encircling it with a halo of poetical associations. The imagination of the Romans of that age was inflamed by the conservative reaction which sought to bridge the chaos of the last century, and revive the sense of national continuity. The thanks the race of Romulus owed to Livy, for making them acquainted with their ancestors and proud of their descent, were akin to those which Englishmen acknowledge to the historical dramas of Shakspeare. He took the dry chronicles, in which alone their first affairs were written, drew forth from them the poetic life of half-forgotten traditions, and clothed it again in forms of ideal beauty. His narrative, glowing in all the colours of imagination and fancy, is just as faithful to its authorities as the dramatized histories of the English bard to theirs; indeed, the myths of Romulus and Tarquin cannot lie farther from the truth of facts than the tragedies of Lear and Cymbeline; and when he begins to tread the domain of sober history, his painted Hannibals and Scipios approach as nearly to the men themselves as the Richards and Henrys of our own mighty master. The charms of Livy's style befitted the happy conjunction of circumstances under which he wrote, and combined with it to give him that preeminence among Roman historians which he never afterwards lost. The events and characters of deepest interest became immutably fixed in the lines in which he had represented them. Henceforth every Roman received from Livy his first impressions of his country's career, which thus became graven for ever in the mind of the nation. It

was in vain that the inaccuracy of these relations, and in many cases their direct falsehood, were pointed out by the votaries of truth, or by jealous and unsuccessful rivals; henceforth it was treason to the majesty of Rome to doubt that Porsena was driven in confusion from her walls, or that the spoils of the Capitol were wrested again from the triumphant legions of Brennus.[1]

Virgil an enthusiast.

The poets lie under no such obligation to speak the truth, and Virgil requires no excuse for his endeavour to inflame the patriotism of his countrymen by a fanciful account of their origin. But, writing as he did a few years earlier than Livy, and in all the glow of patriotic fervour, the spirit which animated him was doubtless far more genuine. The simplicity of his genius shrank from the subtle inventions of the schools, to which, indeed, his youth had been a stranger; he uttered the convictions of an imagination which he felt as an inspiration, and he spoke from a sense of duty which had almost the force of compulsion. We have seen how this child of the Muses, born and bred in rustic retirement, was expelled from his patrimony by an intruding soldier, and restored beyond expectation by the kindly interference of Pollio. We have traced him under the shadow of the gracious patronage of Mæcenas, and the generous countenance of Octavius himself. We have marked the enthusiasm of gratitude for himself, and hope for his country, with which he seized the popular sentiment in favour of the Western triumvir, in his contest with the pirate Sextus and the renegade Antonius. His ardour in the cause of law, order, and tradition assumed the character of a religious sentiment, and he conceived himself devoted to a great moral mission. His purpose widened, and his enthusiasm grew deeper, as

[1] Comp. Plin. *Hist. Nat.* xxxiv. 39.; Tac. *Ann.* iii. 72.

he contemplated the sins of his countrymen, and the means by which alone they might be expiated: their abandonment, on the one hand, of the first duties of their being; on the other, the restoration of belief, and a return to the principles of the past. The character of Virgil deserves the interest and awe which, however grotesquely delineated, it excited in the middle ages. His spirit belonged to the Ages of Faith. In the twelfth century he might have founded an order of monkery or of knighthood.

It is not in his first known compositions, the Eclogues, the dates of which extend from 713 to 717, or from his twenty-ninth to his thirty-third year, that this sense of a religious mission can be generally traced. There is, however, a certain earnestness of feeling in the fourth and sixth, which seems to show that the depths of the poet's soul were already stirring within him; and the ardent love of peace and justice they commonly exhibit, may have sufficed to attract the observation of Mæcenas, as the adviser of the new sovereignty, and lead him to enlist the young enthusiast in the service of the government, to expound in an attractive form the principles it pretended to assert. The tradition that Mæcenas himself suggested the composition of the Georgics may be accepted, not in the literal sense which has generally been attached to it, as a means of reviving the art of husbandry, and the cultivation of the devastated soil of Italy; but rather to recommend the principles of the ancient Romans, their love of home, of labour, of piety, and order; to magnify their domestic happiness and greatness; to make men proud of their country, on better grounds than the mere glory of its arms and the extent of its conquests. It would be absurd to suppose that Virgil's verses induced any Roman to put his hand to the plough, or take from his bailiff the management of his own estates; but they served undoubtedly to

The Eclogues.

The Georgics.

revive some of the simple tastes and sentiments of the olden time, and perpetuated, amidst the vices and corruptions of the empire, a pure stream of sober and innocent enjoyments, of which, as we journey onward, we shall rejoice to catch at least occasional glimpses.

The moral grandeur of the Georgics.

To comprehend the moral grandeur of the Georgics, in point of mere style the most perfect piece of Roman literature, we must regard it as the glorification of Labour. In the better times of Rome, when manual labour was still in honour, it was to husbandry and arms that its exercise was confined. It was not for the reviver of antiquity to cast his eye over newer fields of industry, such as the occupations of trade and science, and direct to them the minds of his countrymen; and of arms there had been already more than enough: it is on husbandry, accordingly, that Virgil fixes his admiration, and throws on the labours of the husbandman, hard and coarse as they seem to the unpurged vision, all the colours of the radiant heaven of the imagination. *Labor improbus*, incessant, importunate labour, conquers all things; subdues the soil, baffles the inclemency of the seasons, defeats the machinations of Nature, that cruel stepmother, and wins the favour and patronage of the gods.[1] *For gods there are* who have ever looked with kindness on the industry and piety of man, who have shown to him the excellent uses of every product of the soil, who have blest his labour with increase, and averted evil from his roof.[2] The first Georgic may be viewed as the poet's protest against the unbelief of philosophy; the shield of

[1] Virgil, *Georg.* i. 121.:

"Pater ipse colendi
Haud facilem esse viam voluit . . . . Labor omnia vincit
Improbus . . . ."

[2] *Georg.* i. 125. 147.:

"Ante Jovem nulli subigebant arva coloni . . . .
Prima Ceres ferro mortales vertere glebam . . . ."

Lucretius is pierced through and through by the fiery blade of Virgil; the frigid pleas of naturalism dissolve in the blaze of lightning which *Jove himself, with his red right hand, hurls from the night of the thunder clouds. . . . Then before all things*, says the preacher, *venerate the Gods*.[1] Nor is religion harsh and exacting in its rites. Though it prescribes many days of repose, and gives no success to ordinary labour on some others, yet certain works there are which are not even then prohibited; the husbandman is never bidden by the Gods to fold his hands in idleness.[2] *May they now*, he continues, *save the saviour of the state, the support of this sinking age.* Octavius was the object against whom all the daggers which had met in his father's bosom were once more levelled; he was exposed to perils in war, to perils by sea and land; his frame was weak, his health was precarious; and the most pious of the Romans were offering vows for his safety, and engaging their heirs to sacrifice to the Gods in their name, in gratitude for the blessing of leaving him their survivor.[3]

The praise of Italy might wean the restless Romans from the visions of an Atlantis, a paradise beyond the sea, which had flitted before their eyes since the days of Sertorius, and which they too often sought to realize by quitting the stern duties of their fatherland for the pleasant indulgences of the East. Its fields and river

The Æneid: the glorification of the Romans and of Augustus.

[1] *Georg.* i. 328. 338.:

"Ipse Pater media nimborum in nocte corusca
Fulmina molitur dextra . . . .
In primis venerare Deos . . . ."

[2] *Georg.* i. 268.:

"Quippe etiam festis quædam exercere diebus
Fas et jurâ sinunt."

[3] Suet. *Oct.* 59.; *Georg.* i. 498.:

"Di patrii Indigetes . . .
Hunc saltem everso juvenem succurrere sæclo
Ne prohibete . . . ."

sides might supply those charms of indolent repose, for which the wearied warrior too often repaired to the blandishments of Athens or Ephesus. The institutions of an imperial republic might be aptly recommended by the example of the prudent bees, the insects which nature has herself endued with the instinct of divine order.[1] But the pious sentiment of Virgil receives its strongest expression in the monument he has erected to the glories of his countrymen, and of their tutelary saint Augustus. The grand religious idea which breathes throughout his Æneid, is the persuasion that the Romans are the sons and successors of the Trojans, the chosen race of heaven, of divine lineage and royal pretensions, whose destinies have engaged all the care of Olympus from the beginning, till they reach at last their consummation in the blissful regeneration of the empire. It maintains the existence of Providence as the bond of the Roman commonwealth. *Yes! there are Gods*, it proclaims, and the glories of Rome demonstrate it. Yes: there are Gods above, and the Romans are their children and their ministers upon earth, exercising in their name a delegated sovereignty, sparing those who yield, but beating down the proud. This is the mission of the race of Assaracus, to vindicate the ways of God to man, to impose upon him the yoke of an eternal peace, and bring all wars to an end for ever![2]

The religious idea which pervades it.

But the government of Olympus is monarchical: the Jove-born demigods and heroes have all been kings themselves, ruling their children and descendants with the dignity and authority of patriarchs. Hence the Romans may submit without dishonour to the sceptre of a patriarch of their

Its vindication of monarchy.

[1] *Georg.* ii. iv.

[2] Virg. *Æn.* ix. 643.:

"Jure omnia bella
Gente sub Assaraci fato ventura resident."

own. He has recovered, indeed, with the sword the kingdom of his ancestors, but the divine effulgence of his countenance suffices to attest his claims. His legitimate right may be traced through his illustrious ancestors, and is impressed upon us by many a sounding reference to the faith of ancient days. Virgil read in the legend of Rome that it was founded by the descendants of Æneas; but this Æneas, though he traced his descent from Trojan kings, and, like other heroes, from Jove himself, neither in this nor in other respects stood preeminent above his peers. In the glories of the Trojan war he had borne no superior part: what claim could be advanced for him to rule over the Trojans, or centre in himself and his posterity the interest of all the offspring of Dardanus and Tros? To raise Æneas to the place of Hector, to make him the virtual successor of Priam, the last and greatest of the heroes, this was the enterprise Virgil undertook. Accordingly, we may observe how everything is made to conspire to thrust this preeminence upon him. Hector himself, when all hope has vanished, counsels his flight from the crumbling city; Hector commends to him the Penates of his land; Hector foretells to him the new city he shall found beyond the seas. Troy has been utterly overthrown, Priam and all his sons have vanished from the stage, Astyanax, the hope of Troy, has perished. Helenus, the last survivor of the race, pious and resigned, speeds the fated hero on his voyage, and assures him of the favour of the Gods. The house of Ilus, the elder branch of the Dardanian stem, is prostrate on the ground; all its rights and honours, its hopes and aspirations, have reverted to the offspring of the cadet Assaracus.[1] Around him

[1] The stemma of the royal race of Troy was this:—1. Dardanus. 2. Erichthonius. 3. Tros. 4. Ilus and Assaracus.

Ilus had 5. Laomedon, 6. Priam, 7. Hector, &c.
Assaracus had 5. Capys, 6. Anchises, 7. Æneas, &c.

the gods of Troy now watch with peculiar care. All his steps are guided or controlled by omens. He submits himself in all things to the will of heaven thus visibly revealed to him. At its bidding he surrenders every natural desire; the desire to perish sword in hand among the flames of Troy, to recover his wandering wife Creusa, to yield to love and repose in the sweet embrace of Dido. The oracles of the Gods still marshal him on his way: they go before him to Italy, and king Latinus is already apprised that he must yield his daughter to a stranger, ere Æneas steps on the Lavinian shore, and presents himself as her suitor.[1] In vain the Furies and Demons interpose, with even the envious Juno at their head; the foe must be overthrown, the bride be won; the chosen race of Dardanus and Assaracus, bearing with it the destinies of Ilus and Priam, must unite with the native dynasty of Alba, and the line of kings which springs from this triple legitimacy combine every right to reign, and fulfil every augury of fortune. To complete the poetic justice of this development of fate, we are reminded that Dardanus himself, the first of the Trojans, was of Italian origin, and his descendants are not really strangers in the land of their adoption.[2] Henceforth the mingled blood of Troy and Latium flows in many channels: in one it descends, through Silvius, Numitor, and Ilia, to Romulus; in another it animates the race of the Julii; and thus Augustus becomes by legitimate adoption the offspring of Iulus and Æneas, of Venus and Jove. Once more, the family of his mother Atia

Homer, *Ill.* xx 219. fol. This genealogy, though not distinctly asserted, is supposed throughout the Æneid.

[1] Virg. *Æn.* vii. 255.:

"Hunc illum fatis externâ ab sede profectum
Portendi generum."

[2] Virg. *Æn.* vii. 206.:

"His ortus ut agris
Dardanus Idæas Phrygiæ penetrârit ad urbes."

derives from Atys, the companion of Iulus, and thus Augustus is Trojan on either side.[1]

Such is the career of piety and such is its reward. The children of Assaracus the Just inherit in the room of the family of Ilus, attainted for the treason of Laomedon. The pious Æneas recovers the patrimony of his first ancestor Dardanus, deprived by violence of his legitimate rights. And thus, too, in the mind of the poet, the pious Augustus recovered the empire of his father Julius, slain by the daggers of faction. Urged by his patron Apollo, and the voice of many oracles, Augustus had crossed the sea to the promised shore of Italy, to claim his rightful inheritance. He, too, had been tost for many years both on land and sea. He had suffered much in wars, while laying the foundations of his everlasting polity. He had traversed a wider realm than Hercules or Bacchus.[2] He had subdued many nations, and overthrown many cities. With noble constancy and firmness he had accomplished the divine designs; no temptations had allured him from the path of duty, and persuaded him to found his state on any foreign soil. The anxiety of the Romans about the often rumoured translation of the seat of empire, whether to Ilium or to Alexandria, had a particular significance. They expected that the victorious triumvir would aspire to found a monarchy, and yet they clung to the belief that no

Augustus shadowed forth in Virgil's Æneas.

[1] *Æn.* v. 568.:

"Alter Atys, genus unde Atium duxere Latini:
Parvus Atys, pueroque puer dilectus Iulo."

These remarks on the poems of Virgil have been derived in a good measure from my recollection of some interesting essays on the Roman poets by a French writer named Legris, in his work entitled *Rome, ou Etudes sur Lucrece, Catulle, Virgile, et Horace*, whose ingenuity, though indulged with too little restraint, has brought out in very striking relief the ideas and sentiments of the period.

[2] *Æn.* vi. 802.:

"Nec vero Alcides tantum telluris obivit, ...
Nec qui pampineis victor juga flectit habenis . . . ."

king could reign at Rome. That the name of the republic would be suffered to remain, while the yoke of royal rule was really fixed upon them, was beyond their power to conceive; accordingly, they were convinced that he meditated establishing himself with his army in some Oriental city, and governing Rome and the world from its regal acropolis. His long sojourns in the East kept this notion constantly alive; the example of Antonius, who had reigned there for ten years, of Julius, whose half-revealed design was nipped, as they imagined, in the bud, and the common passion for escaping from the duties of the citizen to live in licentious independence abroad, all conspired to impress on the minds of the Romans the persuasion that Augustus would sacrifice Rome to a foreign capital. The Æneid may be read as a continued protest against such a crime. Nevertheless, the opinion that Augustus himself is specially represented by its hero cannot be admitted without great reservation. Æneas, ever alarmed by some apparition, always led by soothsayers, flitting from oracle to oracle, believing in dreams, predictions, days and omens, if he resembles Augustus, reflects no less the general type of the slavish superstition of the time. Æneas weeping at every crisis instead of acting, may suit the popular notion of the triumvir, whose effeminacy was the theme of many a lampoon; but surely the poet would have refrained from so far pushing his parallel. The baseness of the hero in deserting Dido, and his slender excuse for abandoning the search for Creusa, at which the moral sense revolts, whatever religious pretext may be devised for them, show how wanting Virgil himself was in delicacy; and the plain injustice of the attack on Turnus has been cited in proof of the blunted sensibility of his age.

The composition of the Æneid occupied the interval between 727 and 735, the year of the poet's death. During this period Virgil made his prin-

cipal residence at Naples, and though an honoured guest at the tables of the great at Rome, he seems to have easily yielded the post of court favourite to rivals of a gayer and perhaps a more supple temper. The honour his writings pay to the principle of religious belief was certainly not assumed for a political purpose. But with a temper naturally inclined to melancholy, neither the objects of his faith nor the prospects it presented to him, were such as to cheer and enliven it. After describing with mournful enthusiasm the virtues of the ancient Romans, it was impossible even for a more sanguine Cæsarean than Virgil to augur a revival of those simple manners which were to him the pledges of happiness and goodness. His view of the progress of the world was the reverse of the Lucretian: but it is hard to say which of the two was the least reasonable; that of the believer who anticipates under the sway of Providence a constant decline of happiness and virtue; or of the sceptic, who, casting man on his own unaided energies, expects him to subdue the evil around him and within him, and to grow from strength to strength, by the force of philosophy and culture. Virgil, we may imagine, in his retirement began already to see the shades closing around the public life of his countrymen, and feared that he had bestowed on the idol of the day a premature and excessive adoration. Possibly he repented the course he had taken, the flattery to which he had pledged his talents and consecrated his existence; and when on his death-bed he desired that his unfinished poem should be destroyed, he may have been moved, not by regret at its imperfections, but by the remorse of an accusing conscience. His last breath, like that of his own gallant Turnus, may have passed away with a groan of indignation. But Augustus knew too well the political value of the Æneid to sacrifice it to a morbid sensibility. He placed it in the hands

Melancholy of Virgil.

of Varius and Plotius for the necessary correction, but strictly charged them to make no additions, nor even to complete the few unfinished lines at which the hand of the master had paused or faltered.[1] Great, undoubtedly, is the debt we owe him for this delicate consideration. The Roman epic abounds in moral and poetical defects: nevertheless it remains the most complete picture of the national mind at its highest elevation, the most precious document of national history, if the history of an age is revealed in its ideas, no less than in its events and incidents. This is the consideration which, with many of us, must raise the interest of the Æneid above that of any other poem of antiquity, and justify the saying of the Virgilian enthusiast, that if Homer really *made Virgil*, undoubtedly it was his greatest work.[2]

Personal appearance of Virgil.

The remark of an ancient biographer that there was a shade of rusticity in the expression of Virgil's countenance, has been amplified by later critics; and the lines of Horace, describing a friend, of many sterling qualities indeed and of fine genius, but coarse in figure, moody in temper, and causing a smile in the ranks of fashion by the carriage of his gown, the cut of his hair, and the fit of his slipper, have been applied to him on the testimony of an early scholiast.[3] The bashfulness and reserve which have been attributed to the poet may at least be accepted as facts: and even these trifling defects of manner might, under the circumstances of society at Rome, be deemed worthy of remark and gentle correction. Under the imperial system, which

[1] Donat. *in Vit. Virgil.* 18.

[2] Voltaire, *Essai sur la Poésie épique.*

[3] Donatus, *Vit. Virgil.* 5.; Acron. *in Horat. Sat.* i. 3, 30, foll.:

> "Iracundior est paulo, minus aptus acutis
> Naribus horum hominum . . . . at ingenium ingens
> Inculto latet hoc sub corpore."

Comp. also *Sat.* i. 4, 35.

sought to mould all men to a common type of complacent mediocrity, the apparition of a single visitant of independent thought and manners, whose honesty and genius condemned the creeping servility of his associates, could not fail to alarm and irritate. In a company whose festivity depended on their success in forgetting themselves, and who disguised their own littleness by mutual applause, the society of the *sacred poet* might be felt as a restraint, and even Augustus and Mæcenas may have breathed more freely when relieved from it.

The political mission of Horace.

We must not fail, indeed, to observe how the emperor himself, much as he set his heart on the high moral principles of conservation and renewal, much as he had on his lips the words, religion and devotion, the sanctity of marriage, the purity of the life philosophical, was not unwilling to encourage by his countenance, and even by his example, such libertinage and dissipation as could be kept within certain conventional limits, and do no violence to public feeling. Looking back for a moment to the age of Cæsar, and to Catullus, who holds up the mirror to its sins, we shall remark how vice, as reflected in his pages, is imbued with the spirit of freedom and independence, which has not yet fled from the atmosphere of Rome. It raises its forehead with the insolence of the tyrant aristocrats born to triumph and rule mankind; it walks abroad, shameless and lusty, gazing and to be gazed at. But when we turn to view it in the days of Augustus, we see it cowering beneath the control of a master, who has subjected it to forms and regulations, removed it from the centre to the side of the street, from the forum to the lanes and alleys, and constrained it to assume, at proper times and places, a show of decency or even a pretence of virtue. Rome is full of hypocrites, who affect gravity and austerity, men who commit every excess in private, but profess in public the so-

briety of the Curii and the Catos.[1] Horace himself, who is charged with the office of chasing the truant vices back to their covert, knows well the limits of his commission: if sin appears in his pictures less coarse and naked than in those of his predecessor, it is because he is only permitted to lift a corner of the veil, to allure his compatriots to indulgence, but not to disgust them by effrontery.[2]

Attempts of Augustus to correct the deterioration of manners among his courtiers.

Examples are not wanting to aid us in conceiving the effect of the great revolution which had recently been accomplished in the social deportment of the Romans. The régime of the first Napoleon which followed the extirpation of the old nobility, and the proscription of their fashions, was marked by vulgarity and rudeness, by a careless affectation of indifference to the manners of polite society, or by absurd attempts to imitate them. The emperor himself had no tact for such conventionalities, and the influence of his consort was at best ill-directed. One of the weak points of his government was the handle given by his court to the mockery of the frivolous and idle. It is interesting to observe the good sense of Augustus and his advisers in perceiving the disadvantage to which his system was subjected by the folly of the classes he called on to support it. To form or correct the habits of the day was no mean part of the policy of the founder of the empire. But all that he did in public as prefect of manners, all his regulations for the conservation of religious and moral principles, were of far less importance towards establishing his power than the means he employed for moulding the demeanour of the citizens, so that it should obtain

[1] Hor. *Epist.* i. 16, 57.:

"Vir bonus, omne forum quem spectat et omne tribunal. . . ."

[2] There can be no doubt that the scandalous anecdote told of Horace's private habits, in the life of him ascribed to Suetonius, really refers to another person.

general respect, and trample on no prejudices. The aristocracy of birth and honours had been almost swept away: it was necessary to replace it; and for this no other materials were at hand but the clever officials, the trusty soldiers, the astute freedmen of noble houses, the bankers, usurers, and traders, who, in waiting upon the necessities of their betters, had taken the varnish of their manners. The senate of Augustus was in short an assembly of plebeians, but of plebeians more vain of their position than an Æmilius or Valerius, a Marcius or an Hortensius: while Gorgonius was boorish and rude even to affectation, Rufillus was not less offensive from his pretensions to excessive refinement.[1] These men were to be fashioned to the mode, first by tailors and wig-makers, and next by the parasite or poet of the court, the master of ceremonies to the emperor, or rather, that his own influence might be less apparent, to his minister and confidant. They were to be taught not only to wear their toga decorously, but to bear themselves politely at the table, or at the theatre and circus. If Domitius Marsus, a favourite writer of the day, devoted a treatise to instruction in *urbanity*, or the graces of town conversation, the whole philosophy of good breeding was reviewed by Horace in the poetical discourses, to which he gave the old Roman name of Satires or Medleys.[2]

Career of Horace.

The part Horace had taken in the civil wars, to which a boyish enthusiasm had impelled him, was soon over. After Philippi, his first and only field, he abjured the service of liberty,

[1] Hor. *Sat.* i. 4, 92.:

"Pastillum Rufillus olet, Gorgonius hircum."

[2] Quintilian (*Inst. Orat.* vi. 3, 102.) speaks of such a treatise by Domitius Marsus, a poet of the Augustan age: "Qui de urbanitate diligentissime scripsit." But the *urbanitas* of Marsus is rather pleasantry than politeness. "Urbanitas est virtus quædam in breve dictum coacta et apta ad delectandos movendosque homines," &c.

and finding his way almost friendless to Rome, began writing verses and making himself a name, while solicitous only for his daily bread. Careless and incorrect as his first pieces are, sometimes vapid in sense and ill-conditioned in their object, there were not wanting among them some of a better character, fitted to impress a sagacious reader with a high idea of his genius. Virgil is said in the popular tradition to have been the first to make the discovery, and to have introduced Horace in all simplicity to Mæcenas as a man of poetical promise. But this, however he might affect to patronize literature for its own sake, was not all the minister required; and for some time, a few courteous words were all the notice he thought fit to take of his new acquaintance. But Horace improved his own fortunes. He continued to write with more earnestness and in a tone of greater self-respect; he mingled with his compositions compliments to the minister so delicate that neither could be ashamed of them. He acquired the great man's friendship, and was received gradually into closer intimacy and even confidence. But we know not how far this confidence really went. The citizens doubtless surmised that it extended to public affairs, and that Horace was consulted by Mæcenas on the disposal of his patronage, or the assignment of colonial territories. It was the business of the poet to laugh away these conjectures, possibly to put the guessers on a wrong scent, and represent himself as totally unconnected with politics, absolutely devoid of ambition, satisfied with the smallest favours, a sincere, independent friend of the minister, and even of the emperor himself. Certain it is that Horace, however strict may have been the attachment between himself and the men in power, obtained neither riches nor office. He was gratified with the present of a moderate estate, the Sabine farm, of which he sings with such pleasing anima-

The nature of his connexion with Augustus and Mæcenas.

tion; and professing himself simple in his tastes, with few wants, being unmarried, and apparently without kinsmen, he was satisfied with the golden mean of fortune which entailed on him neither trouble nor anxiety.[1] To the Roman, whose pleasures and amusements were mostly public, and who might satiate every lawful taste with the libraries, the baths, the shows, and the galleries of the great city, the want of large personal means brought no sensible deprivations. It was the policy of Augustus to curtail the excessive affluence of the few, and make the masses dependent for their enjoyments on the government itself. It was doing him good service therefore to expose to scorn or ridicule the men who made a parade of their wealth, or betrayed anxiety to amass it; to sing the praise of simplicity and indifference, and contrast with the smoke, the noise and splendour of Rome, the languid indolence of midday slumbers in the meadow.[2] At the same time the jealousy of the new nobility might demand some consolation from their patrons for the mortification they experienced at the sneers of the survivors of the true aristocracy. For them Horace had a salve in his specious disparagement of illustrious parentage, and descent from generations of official notabilities.[3] But whether he rebukes the vain, or ministers comfort to wounded susceptibility, he knows the art of sweetening his potions by his tone of good-humoured levity and banter. Angry passions, he suggests, have been ex-

[1] *Epist.* ii. 2, 159.: "Qui te pascit ager tuus est."

[2] Compare Horace's sneers at the "Fanum et opes strepitumque Romæ," &c., with the conclusion of Virgil's second Georgic—the "Quid bellicosus Cantaber et Scythes," of the one, &c., with the "Non res Romanæ perituraque regna," or the "Conjurato descendens Dacus ab Istro," of the other. Surely both drew their inspiration from the same official source.

[3] Hor. *Sat.* i. 6. fin.:

"His me consolor victurum suavius, ac si
Quæstor avus, pater atque meus, patruusque fuisset."

cited more than enough; it is time to allay irritation, to relieve men of their fears, to surround the throne with cheerful countenances; to let all men know each other's weaknesses, and rely upon mutual indulgence. The genial magician who shall thus transform society must have special qualifications for a task so delicate. He must be of no family illustration himself, to make the new men jealous; he must be a man of courtly manners, to satisfy the taste of the refined; he must dress with faultless neatness rather than elegance, trim his hair and beard carefully but not fantastically, have a tender indulgence for the vices of good company, and if his own stomach is too weak for an occasional excess, he must sit through the festive meetings of his companions, and enjoy at least their enjoyment.[1] He must be fond of music and poetry; and if he is able to entertain others with his wit, if, above all, he can strike the lyre to notes of genial harmony himself, he will become the soul of fellowship, the emperor's viceroy in the realms of fashion. He must be able to invest ordinary ideas with elegant language, and appeal to educated mediocrity by sentiments level with its understanding; and then, if he can sometimes take a higher flight, and utter bursts of inspiration, solemn, passionate, and tender, if he can assume an enthusiasm worthy of a Roman freeman or a Grecian bard, and emulate the fire of Pindar with the steady glow of a sustained dignity, he will combine the voices of the generous and the vulgar,

[1] Accordingly Augustus, we are told, used to call him *homuncionem lepidissimum*. Suet. *vit. Hor.* Some pleasing fragments of the emperor's letters to the poet are given in this biography, and may not improbably be genuine. Horace says of himself:

> "Quem tenues decuere comæ, nitidique capilli;
> Quem scis immunem Cinaræ placuisse rapaci;
> Quem bibulum liquidi media de nocte Falerni
> Cœna juvat."

Epist. i. 14, 32. Comp. i. 7, 26.

of the future and of the present, and become a fixed star in the heaven of poetry.

Horace's pretensions to religious sentiment.

A further task remains, however, for the favoured instrument of ministerial conservatism. Horace must teach the Roman gentlemen to be religious, or at least to appear so. Horace was himself, so he seems to confess, something of a scapegrace in his youth: one who could be so wrong and foolish as to embrace the cause of the murderers of divine Julius, must have imbibed some very false notions from the sources of his philosophy. He had dallied with the Greek ideologists, the corrupters of youth, in the schools of Athens; he had fancied himself a disciple of Epicurus: child as he was, he had affected to renounce allegiance to all sound principles of religion as well as of politics. Under the change of his fortunes he has had the grace to repent; he has become devout; he wishes his countrymen to know how highly he now thinks of Jupiter and Apollo, no less than of Augustus and Mæcenas. A man of ardent imagination and of delicate sensibility, a man who questioned the world and his own conscience both solemnly and sternly,—such a man as Virgil, for instance,—might well persuade himself that the miseries he had witnessed attested the mortal sin of renouncing the worship of the Gods, and compassing the destruction of their hero; but Horace has no such claim on our indulgent interpretation, and the palinodes of his lyric muse ring false to an attentive ear.[1]

[1] Horace is indiscreet in assigning the motives of his conversion, which have caused much perplexity to the critics who wished to believe him in earnest. *Od.* i. 34.:

"Parcus Deorum cultor et infrequens . . .
. . . . . Namque Diespiter
Igni corusco nubila dividens
Plerumque, per sudum tonantes
Egit equos."

Compare i. 22.: "Namque me sylva lupus in Sabina . . . ."
ii. 17.: "Me truncus illapsus cerebro . . . ."
iii. 4.: "Non sine Dis animosus infans."

Horace employed to recommend moderation and contentment to the restless nobles.

It can hardly be mere accident that the pieces in which this subtle moralist inculcates temperance and sobriety of thought and action, which denounce the vanity of ambition and the cares of greatness, are addressed in almost every case to scions of the noblest and proudest houses. Such is the character of the odes to Lollius and Licinius, to Torquatus and Quinctius, to Postumus and Dellius, Antonius, Pompeius, and Plancus.[1] When we remember that these men were precisely of the class to which the regards of Augustus and his minister were most jealously directed, such a concurrence of similar warnings, repeated to more than satiety, seems to admit of only one explanation. The minion of the usurping dynasty would not have been countenanced in such frequent and familiar addresses to men whose restless ambition, whose exalted birth and ample means made them formidable to the court, more than one of whom had been found in open or secret array against it, unless on condition of exerting his influence to curb their impatience, and chastise their illicit aspirations.[2] Horace resounds the praises of Italy in strains not dissimilar to those of Virgil; and we are again reminded, by his fervid encomiums on the beauties of that sacred soil, of the anxiety of his master to recall the truant spirits of his subjects from the charms of Greece and Asia to the post of piety and duty.[3]

[1] Comp. *Epist.* i. 6.: To Numicius: "Nil admirari . . . ." We have met with several of these names ranged on the side of the senate against Cæsar, or of the Eastern against the Western triumvir.

[2] Legris ventures to explain the perplexing ode to Plancus (*Od.* i. 7.), with its preference of Tiber and the Anio over Argos and Larissa, as a covert invitation to renounce the service of the tyrant of the East, and join the defender of his native land. It is difficult to see why a poet should make any mystery of such an object. Yet the well-known political poem (*Epod.* 16.: "Altera jam teritur") bears considerable analogy to this, and other odes of Horace have unquestionably a covert allusion to the state of public affairs.

[3] Compare, also, Propert. iii. 22.:

"Omnia Romanæ cedent miracula terræ," &c.

We cannot, perhaps, easily exaggerate the influence which the cheerful subservience of the Horatian muse exerted upon patriots willing to be persuaded, and pleased to have their weakness gilded with the names of good sense and philosophy. Horace was rewarded, if not splendidly, at least to the extent of his desires: he enjoyed ease, reputation, the fellowship of the good and witty; he who had commenced life in search of a patron, finished it as the observed of all observers. Yet it may be true that the attainment of every wish left him despondent and dissatisfied with himself. If I rightly understand the chronology of his compositions, those which seem to be among the latest betray a spirit of mortification, rather than the cheerfulness to which he at least pretended in his earlier years.[1] He now longs for retirement; he seeks to be released from servitude; he seems even ashamed of his success in seconding the policy of his masters. He quits the thorny path of politics, and the transparent shades of his assumed philosophy, and sickens at last over the long-abused refrain of all his poetry, that wisdom is better than wealth and honours, liberty and beauty, acknowledging with a bitter smile that contentment depends more on the digestion than the finest precepts of the schools.[2] Finally, he amuses himself with meditation on literature, and the innocent recreations of abstract criticism. The *Art of Poetry* is a curious, perhaps we may say an instructive, eutha-

Dissatisfaction of Horace in his later years.

[1] Compare, for instance, Hor. *Epist.* i. 1, 2, 7, 8, 10.: "Non eadem est ætas non mens—Solve senescentem—Sic mihi tarda fluunt ingrataque tempora—Sapere aude. Incipe—Quod si me noles unquam discedere—Mihi jam non regia Roma—Vivere nec pulchre nec suaviter—Mente minus validus quam corpore—Vivo et regno simul ista reliqui."

[2] Hor. *Epist.* i. 1, fin.:

"Ad summum sapiens uno minor est Jove, dives,
Liber, honoratus, pulcher, rex denique regum,
Præcipue sanus, nisi *cum pituita molesta* est."

nasia to the fervid exaltation of his youth, and the decorous accommodation of his maturer years.[1]

A dissertation has been written to show that the disagreeable acquaintance whom Horace sought in vain to shake off in the Via Sacra was no other than the poet Propertius. The hypothesis, fanciful as it seems, is not altogether devoid of probability; but whether it be correct or not, there is undoubtedly something in the character of Propertius, as we trace it in his writings, which harmonizes with such an estimate of him. While the

Propertius.

[1] The commentators have found a golden key to the chronology of Horace's writings in the lines which terminate his address to the first book of the Epistles:

"Forte meum si te quis percontabitur ævum,
Me quater undenos sciat implevisse Decembres,
Collegam Lepidum quo duxit Lollius anno."

This consulship was A.U. 733. But this allusion proves nothing except of course that the book was not published earlier than that date. There is no reason why it should not have been sent forth some years later; and such I believe, from the evidence both of style and matter, was really the case. The Epodes, most of which were among the writer's earliest compositions, which were circulated, like his other pieces, from hand to hand long before they were collected into a volume, breathe the freshness and independence, together with the inaccuracy, of youth. The two books of Satires and the first three of Odes were composed probably together during a series of years, and belong to the period in which Horace was actively employed in the service of his patrons. The last book of Odes, we are told, was published at the express desire of Augustus, and the few pieces it contains were probably strung together as a vehicle for the exhibition of the fine poems in praise of the imperial family. But in the first book of the Epistles we find the poet complaining that he has no longer the spirit for composition ("Non eadem est ætas non mens"), and parrying the solicitations of Mæcenas to resume the task. He shows an inclination to withdraw from political service: he complains of himself and of the world. Finally, the three long pieces which conclude the collection are evidently the work of a single period, when he had at last succeeded in throwing off the yoke of servitude, and could indulge himself, and perhaps seek forgetfulness, in polished and sensible but not very profound nor very careful, remarks on the literary taste of his day. Horace was born in 689, and died in 746, within a few days perhaps of Mæcenas, but later, if we may believe the story that the dying minister recommended him to Augustus with the words, "Horatii Flacci ut mei memor esto." Suet. in *vit. Hor.*

favour of the rulers of the commonwealth was showered upon Virgil and Horace, Varius and Plotius, recommended by the eminence of their commanding genius, or the exquisiteness of their tact, there were doubtless other men, of considerable pretensions to literary talent, who sought a share in their distinctions, and were eager to barter the incense they could offer for the smiles and sunshine of the court. Among these, none perhaps was more distinguished than Propertius; yet in the race of favour he seems to have fallen far behind his more fortunate rivals. He started, indeed, in early life from the same common goal with them, being introduced to the notice of Mæcenas as a victim of the revolution. His abilities gave ample promise; and he qualified himself for the minister's consideration by the zeal with which he sought to gild with all the ornaments of verse the false idols of the day, in making vice and voluptuousness graceful, in singing in sounding verse the legends of Roman mythology, and in praising to the skies the glories of Augustus, and the virtues of his trusty counsellor. But on all these topics, similar as they are to those which Horace has so delicately recommended to us, we feel sensibly the inferior powers of his less successful competitor. Propertius is deficient in that light touch and exquisitely polished taste which volatilize the sensuality and flattery of Horace. The playfulness of the Sabine bard is that of the lapdog, while the Umbrian reminds us of the pranks of a clumsier and less tolerated quadruped.[1] Amidst all his affected indifference, the art of Mæcenas must have been constantly exercised in keeping importunate suitors at a distance. The assiduity of Propertius was perhaps too officious, and it was necessary to repel without offending him. Like all his unfortunate class, he could not understand how,

[1] Propert. iv. 1, 64.: "Umbria Romani patria Callimachi."

with undoubted talents and acknowledged industry, his pursuit of the great was through life a failure, while that of his rivals, who seemed so much less eager in it, was crowned with such distinguished rewards. Nevertheless, this disappointment was not wholly merited. Although Propertius is often frigid and pedantic in his sentiments, though he takes his learning from dictionaries and his gallantry from romances, and retails at second hand the flattery of his contemporaries, there is notwithstanding a strength, and sometimes a grandeur in his language, which would have been more highly relished in the sterner age of Lucretius. His rustic muse, though brought as a willing captive to the tables of the great at Rome, seems sometimes to break her silken fetters, and bound along in the wilder measures of her native mountains. Propertius stands alone among the Roman poets in the force and fervour he imparts to elegiac verse: he alone raises the soft and languid pentameter to the dignity of its heroic consort.[1] But it is in the weight of single lines, and the manly savour of occasional expressions, that the charm of this writer is to be found: he has none of the form of poetical invention, and is alike deficient in sustained majesty, in natural grace, and in flowing rhythm.

Tibullus.

A contemporary of Propertius, and also a writer of elegiac poetry, is Albius Tibullus, the sweetness of whose versification, deficient though it is both in variety and strength, is remarkable at least from the early period to which it belongs. But Tibullus deserves our consideration on a more im-

[1] As for instance in the lines:
iii. 7, 56.: "Cum moribunda niger clauderet ora liquor."
iii. 11, 56.: "Jura dare et statuas inter et arma Mari."
iv. 6, 42.: "Imposuit proræ publica vota tuæ."
iv. 11, 46.: "Viximus insignes inter utramque facem."
Rutilius, in the fourth century of our era, is the only writer who deserves to be compared in this respect with Propertius.

portant ground, for the singular independence of character he exhibits in relation to the court of Augustus. Like so many of his most distinguished contemporaries, he had been dispossessed of his estates at Pedum, near Prænestе, by the soldiers of Octavius; but he too, like them, had the fortune to recover his patrimony, at least in part, and this probably through the good offices of Messala. To Messala accordingly, as his patron, he attached himself through life, following him throughout his campaigns in Aquitania, and sharing the glory and merits of his success. Tibullus sings of this distant warfare with more than usual animation, though generally he expresses a poet's aversion to the toils of military life: nevertheless the heroic poem, specially dedicated to the praise of Messala, which passes under his name, can perhaps hardly be ascribed to him. The most virtuous of the Roman nobles seems to have exacted no unworthy compliances of his grateful client. Messala, it would appear, was himself surrounded, like Mæcenas or Agrippa, with a retinue of versifiers as well as of warriors, and kept a mimic court of his own, as a chief of the ancient aristocracy. Certain it is that Tibullus refrained from all flattery of the rival following of Octavius. Throughout his works there is no mention made either of Augustus or of his ministers and associates. Yet the imperial court, on its part, was not indisposed to flatter and solicit him. Horace addressed him more than once in kindly and complimentary strains, which seem to invite him to enrol himself also in the cohort of the bards of the empire.[1] If such was Horace's view, it would appear that he was wholly unsuccessful. The muse of Tibullus, constant to its chosen theme, was devoted to singing his generally unprosperous loves; yet the tone of tender melancholy which pervades its elegies

[1] Hor. *Od.* i. 23.; *Epist.* i. 4.

may have had a deeper and purer source than the caprices of three inconstant paramours. The spirit of Tibullus is eminently religious; but his religion bids him fold his hands in resignation rather than open them in hope[1]: there is something soothing at least in the idea that he alone of the great poets of his day remained undazzled by the glitter of the Cæsarean usurpation, and pined away in unavailing despondency in beholding the subjugation of his country.[2]

Ovid,

Virgil and Horace may have had, besides the common throng of admirers, the audience fit, though few, of some solitary students; but Ovid is eminently the poet of society, and the various styles of composition in which he excelled, disclose to us the tastes and interests of the day, and reflect the tone of ordinary sentiment in the higher ranks of the capital. Fatigued as they were with the unbending exaltation of the epic and the lyric, the *Elegies* and *Art of Love* attracted and delighted them as the representation, but slightly disguised or idealized, of actual manners and habits. Ovid was the successor in elegy of Propertius and Tibullus, of Gallus and Marsus; but it is probable that all these writers drew from the common fountain of Grecian inspiration, and even from the effusions of a single author, Parthenius. Born at Nicæa, and carried captive as a child to Rome in the wars of Mithridates, the talents of Parthenius, and his powers of pleasing, had obtained him freedom and reception among the highest circles. He was the author of erotic elegies in verse, some of them lively and joyous, others of a

Imitator of Parthenius.

[1] "Cœlo *supinas* si tuleris manus." For the indications of this religious spirit, see particularly i. 1, 37., ii. 80., iii. 57., and Ovid, *Amor.* iii. 9, 37.

[2] See some remarks on Tibullus in Legris's second volume. Tibullus died young, according to the epigram ascribed to Marsus:

"Te quoque Virgilio comitem non æqua, Tibulle,
Mors juvenem campos misit ad Elysios."

funereal strain. Among the first of his disciples were Gallus and Virgil, and some lines of the Georgics, it is said, were fashioned directly upon his models. Tiberius Cæsar, who affected himself to compose Greek verses, had such admiration for this poet, that he caused his bust and writings to be placed in the public libraries among the most famous notabilities of his nation. His influence may be traced in the *Heroids* of Ovid, in which the most tragic love stories of ancient legend are versified under the form of epistles, and which seem to have been founded on the summaries Parthenius had specially drawn up for the use of Cornelius Gallus.[1] But however elegant the Grecian may have been in his style, or copious in the flow of his language, it was doubtless to his training in the schools of the rhetoricians that Ovid owed the wonderful variety he has been able to introduce into a set of subjects so similar in character, in which the universal passion, deserted or unsuccessful, is made to breathe from the mouths of Sappho or Œnone, Ariadne or Medea. If the poet has failed to catch the simplicity of the best heroic models, he has at least imbibed a portion of their purity and depth of feeling. The *Loves of the Heroines* is the most elevated and refined in sentiment of all elegiac compositions of the Romans. If we may argue back from Ovid to Parthenius, the marked predilection of Tiberius for the Grecian poetaster will appear not discreditable to that prince's taste and feeling.

The Heroic.

It is possible that the same author suggested to Ovid the idea of his extraordinary poem on the *Metamorphoses*, or *Transformations*, of Greek and Roman mythology, in which the wealth of his fancy is displayed still more abundantly, and is

The Metamorphoses.

[1] See Walckenaer's *Histoire d'Horace*, ii. 197., from Suidas in voc. Gellius, ix. 9., xiii. 26.; Suet. *Tiber.* 70.

at times combined with an epic majesty of diction. Its structure betrays at once the occasions for which it was written; for the slender thread of connexion which runs through it is unable to sustain any continued interest, while the repetition of similar incidents, however ingeniously varied in relation, would become inexpressibly wearisome in a continuous perusal. But viewed as a series of sketches intended for successive recitation to the same, and often to different audiences, the Metamorphoses is perfectly adapted to the author's object. The work rolls on in an uniform line, without a catastrophe or a climax, to its chronological termination: yet the Romans may have drawn a political moral from the philosophy of Pythagoras in the concluding book, which taught that all things change, but nothing perishes; and may have felt that the transformation of the republic into an empire was no more than a crowning illustration of the ruling principle of the work.[1]

The Fasti.

The *Fasti* assumes a character of considerable importance when we regard Ovid, not as a poet giving utterance to his own enthusiasm, but as the fashionable author addressing himself always to the current taste or interest of society. The work which goes under that name may be described as the pontifical ritual in verse: it gives the rationale of the calendar, and of the stated observances of the national religion: it digests *the Seasons and the Reasons* of every special cult and ceremony.[2] Such a work, it would appear, must have been calculated to meet a popular demand. The Roman people required an explanation, in the courtly and graceful style to which

[1] Ovid, *Metam.* xv. 165.: "Omnia mutantur, nihil interit."

[2] Ovid, *Fast.* i. 1.: "Tempora cum causis Latium digesta per annum." The Fasti is remarkable, even among the works of Ovid, for its combination of ease with dignity. No where else are his stories told with such vivacity and perspicuousness. There is no better example, perhaps, of narrative in verse than in the legend of Anna Perenna. iii. 557, foll.

alone they would listen, of the usages to which they had solemnly devoted themselves. With these fair and sounding verses the poet satisfied the ecclesiastical spirit of the times, which leant with fond reliance on forms and traditions, and was less a thing to be felt than to be talked about. From the appearance of such a work, we may feel assured that the decree of Augustus, that the Romans should become again a religious people, was duly accepted on their part and ratified by their outward practice; that they actually set themselves to worship the gods after the manner of their fathers on the emperor's admonition. It would be idle to say that this was mere hypocrisy or flattery: doubtless there was felt a spiritual want, and multitudes blindly followed the blind leaders who offered themselves, and took their faith in all sincerity from Augustus, and their ritual complacently from Ovid.

The gloom and despondency which pervade this poet's later writings, the *Tristia*, or *Sorrows*, and the *Epistles from the Euxine*, are explained and excused by the painful circumstances under which they were composed: the exile of the Roman Siberia speaks the natural language of a spoilt child in suffering.[1] Yet there is something instructive here also, in witnessing the breaking down of the old Roman fortitude, which seems to have been among the first of the virtues of the republic to wither under the shadow of the empire. Neither the melancholy of Virgil, nor the self-dissatisfaction we have remarked in Horace, would have been betrayed in word or deed in the period of true pride and self-reliance.[2] We should

The Tristia and Epistles ex Ponto.

[1] The *Ibis*, however, an attack upon some nameless slanderer, who had trampled on him in his misfortunes, is as energetic as could be desired; while the address to his wife (*Trist.* iii. 7.) reaches a lofty pitch of manly endurance.

[2] We may be allowed, however, to question whether even a Coriolanus could have used such an expression as, *Romans, I banish you!* which Shakspeare has transferred to him from the mouth of the cynic Diogenes. Shaksp. *Coriol.* act iii.

be curious to learn how the lamentations of the banished poet were received by his associates at home. They moved the compassion neither of Augustus nor of his successor; and there is too much reason to fear that neither the friends he so piteously intercedes with, nor the wife he praises so feelingly, ventured to move in his behalf. Long before his death, Ovid, we may believe, was forgotten in the land he so miserably yearned for; and it was not perhaps till after his own tongue had grown cold, that the verses it poured forth in so copious a stream were brought from the desks of his correspondents, and published for the interest of the world. In the course of time the empire teemed with a society of fellow-sufferers, who learnt perhaps, from their own woes, to sympathize with the lamentations of the first generation of exiles. The *Tristia* of Ovid became the common expression of the sentiments of a whole class of unfortunates.

Conclusion.

I have thus sought to give a view of the ideas of the Augustan era, from a few representative examples; but it would detain us too long from our narrative were we to examine the subject of its literature through all its elements and features. For the same reason, and because indeed the remains we possess of them are still more fragmentary, not from undervaluing their significance in expressing the mind of their age, I omit all reference, here at least, to the arts and sciences of the period, to its painting, architecture and sculpture, as well as to its investigations in ethics and physics. The moral character of these times is indeed a subject of still deeper interest, and one which it will become us to study with all the resources of knowledge and application we can command; but it will be well to postpone this survey till we can compare the Roman principles and practice with the Christian, and scrutinize both by the light which they will throw recipro-

cally upon each other. Meanwhile I return to the political history of the empire, as far as we can succeed in penetrating its obscurity; for the guides who deign to aid us will prove too often blind or treacherous; and we shall march like the hero of Virgil in the infernal twilight, by the malign rays of Tacitus and Suetonius, through the gloom of a tyranny which has overshadowed men and things, and confused the various colours of events and characters.[1]

[1] Virgil, *Æn.* vi. 270.:

"Quale per incertam lunam sub luce maligna
Est iter in sylvis, ubi cœlum condidit umbra
Jupiter, et rebus nox abstulit atra colorem."

CHAPTER XLII.

Tiberius succeeds to the empire.—His condescension to the senate, and pretended reluctance to accept power.—Mutiny of the legions in Pannonia and on the Rhine, quelled by Drusus and Germanicus. —Character of Germanicus.—His popularity awakens the jealousy of Tiberius.—Campaigns of Germanicus beyond the Rhine in 767, 768, and 769.—He revisits the scene of the slaughter of Varus.— Disaster on his return by sea.—Germanicus reaches the Weser.— Quarrel between Arminius and his brother Flavius.—Battle of Idistavisus.—Successive defeats of the Germans, and barren trophies of the Romans.—Second disaster by sea.—The eagles of Varus recovered.—The frontier of the empire recedes finally to the Rhine.—Return of Germanicus to Rome, and triumph there. —Gloomy forebodings of the people. (A.D. 14—17, A.U. 767—770.)

The Romans ready to acquiesce in the succession of Tiberius.

It may be recorded in praise of Augustus, among few other sovereigns who have long survived the date of their early popularity, that no burst of general satisfaction hailed the announcement of his decease. The old man had no doubt become stale and wearisome to his countrymen; a damp had been cast on their spirits by the dull shade of a monotonous rule, which had long ceased to be relieved by gleams of adventitious splendour. The prosperity of his latter years had been clouded by alarming disasters; yet these had not so depressed the feelings of the nation as the leaden weight of an administration which seemed concerned only to avert motives of popular excitement. The generation which had admired Augustus as the genius of beneficent government had descended into the tomb: it had been succeeded by one which regarded him only as a despot, or, more unfavourably still, as a pedant. Whatever discontent, however, might lie smothered beneath the external forms of

loyal submission, the approaching end of his long domination was anticipated in no quarter as the advent of a new era.[1] Augustus himself justly presumed that no party contemplated the restoration of the republic on his decease; he was content to warn his successor against the personal ambition of the most eminent nobles, those who might be expected to covet the sovereignty, and those who without coveting might be deemed fit to wield it.[2] But the great mass of the citizens acquiesced at this crisis in the conviction that the man who had shared his later counsels would be appointed heir to his relinquished powers. They contemplated without a murmur the succession of Tiberius to the complete cycle of the imperial functions, from no personal regard or admiration, nor from any deliberate belief that he was the fittest of the citizens to assume preeminence, but from a half-conscious acknowledgment of his divine or legitimate right as the adopted son of the hero Augustus, himself the adopted son of the divine Julius. Such is the proneness of the human mind to discover a right for a once established and uncontested might; so smooth is the path of usurpation, when it has once succeeded in scaling the barriers of the law. It was not in vain that Augustus had cherished among his subjects the remnant of religious feeling; he was rewarded by becoming himself the centre of their idolatry, and imparting a ray of his own adorable godhead to the heir of his name and titles.

Self-distrust of Tiberius.

But with the fortunes of Augustus, Tiberius did not inherit that reliance on his personal merits which nerved the arm of his predecessor, and imbued him with so lofty a sense of his

[1] Tac. *Ann.* i. 4.: "Postquam provecta jam senectus ægre et corpore fatigabatur, aderatque finis et spes novæ: pauci bona libertatis incassum disserere: plures bellum pavescere, alii cupere: pars multo maxima immmentes dominos variis rumoribus disserere."

[2] Tac. *Ann.* i. 13.

mission. Though certainly with no mean ability, both military and administrative, he seems to have been wanting in the higher quality of genius which seizes or makes its opportunities, and floats on the crest of the swelling waves of a national inspiration. Of this he was himself painfully sensible; and it was the consciousness that he could neither kindle the imagination of the soldiers like Julius, nor of the citizens like Augustus, that made him feel less secure of their obedience than he really was. He had suffered, indeed, though mainly through his own perverseness, a fall from power, which rendered him keenly alive to the precariousness of his elevation, and to the dangers which attend on infirmities of temper in the great. The secret of his predecessor's success had lain, as he was perhaps aware, in the perfect equilibrium of his abilities and his temper, in the combination of genius with self-command; his own conscious deficiency in this particular chilled him as an omen of ultimate failure, as it had already been the cause of his temporary disgrace. Tiberius reigned in the constant apprehension of the crash which he expected to overwhelm him; the sword of Damocles seemed ever suspended over him; and he scanned with angry perturbation the countenances of all who approached him, to discover whether they too saw the fatal spectre which was never absent from his own imagination.[1]

Death of Augustus announced.

At the critical moment he might himself have hesitated and looked timidly around him; but he was fortunate, if one may say so, in having in his mother Livia an ally endued with the unity of object and promptness in action which so strongly characterize her sex. Augustus, it seems probable, had not yet breathed his last, and

[1] One passing stroke from Pliny on this subject rivals in effect the elaborate paintings of Tacitus: "Tiberius tristissimus, ut constat hominum." *Hist. Nat.* xxviii. 5.

his step-son, hastily recalled from the Dalmatian coast, was not yet in attendance on his death-bed, when the empress boldly ventured to take the necessary measures to prevent the tidings of his decease being too soon made public. When, however, Tiberius was himself on the spot, there was no further occasion for disguise, and the decease of the late imperator was proclaimed at the same moment with the substitution of a successor.[1] The fidelity of the few troops about the capital, already bound by the military sacrament to their actual chief's coadjutor, was sufficiently assured; obedience to the orders of Tiberius had become habitual to them. Nor was there any real cause for apprehension lest a rival should start up among the nobility of the capital. Of the possible competitors already designated by Augustus, Lepidus, he had said, was equal to empire, but would disdain it; Asinius Gallus might be ambitious of it, but was unequal to the post; and one only, the rich and high-born Arruntius, had the spirit both to desire, and, if occasion served, to contend for it.[2] But Arruntius bore no official distinction or military reputation; no circumstances had combined to smooth his way to such an elevation, and the only immediate risk of competition lay in the members of the Cæsarean family itself. Of these, Germanicus was at the moment absent: Drusus, the youthful child of Tibe-

[1] Tac. *Ann.* i. 5.: "Provisis quæ tempus monebat, simul excessisse Augustum et rerum potiri Neronem, fama eadem tulit."

[2] Tac. *Ann.* i. 13.: "M. Lepidum dixerat capacem, sed aspernantem; Gallum Asinium avidum, et minorem; L. Arruntium non indignum, et si casus daretur ausurum." M. Æmilius Lepidus was brother of the Paulus Æmilius, husband of the younger Julia, who conspired against Augustus. See vol. iv. chap. xxxviii. He continued in the enjoyment of favour and dignity till his death, A. U. 786. Tac. *Ann.* vi. 27.; see below. C. Asinius Gallus was son of Asinius Pollio, and married to Vipsania, the divorced wife of Tiberius. For his death, 783, see below. L. Arruntius was son of a lieutenant of Augustus in the battle of Actium (consul A. U. 732). His suicide, A. U. 790, will be mentioned in its place.

rius, had yet acquired no independent position; but the wretched Agrippa still lingered in his island-prison, and the rumour that Augustus had recently visited him in secret, and held out, not without tokens of affection, some hopes of release and favour, had excited the jealous fears both of Livia and her son. As soon as Augustus ceased to breathe, and even before his decease was proclaimed, an order was conveyed to the centurion in guard over the captive to put him to death. Such was the belief of the times; but whether the order was issued by Livia, without her son's privity, or whether it was the first act of the new Cæsar's authority, the propagators of the rumour were not agreed. A hint seems indeed to have been thrown out that Augustus had instructed the keepers to kill their prisoner as soon as his own death should be known, to anticipate the risk of disturbance in the succession; and Tiberius publicly declared that the deed was not commanded by him; nevertheless he took no steps to explain the mystery, and the perpetrators of a crime thus officially acknowledged were allowed to remain unquestioned.[1]

Rumoured assassination of Agrippa Postumus.

With the announcement of the emperor's decease Tiberius summoned the senate by virtue of his tribunitian power.[2] The consuls Appuleius and Pompeius

[1] Tacitus ascribes the act without hesitation to Tiberius: "Primum facinus novi principatus fuit Postumi Agrippæ cædes" . . . . and Dion follows him. Suetonius speaks more dubiously: "Quos codicillos dubium fuit Augustusne moriens reliquisset quo materiam tumultus post se subduceret, an nomine Augusti Livia, et ea conscio Tiberio an ignaro dictâsset." Velleius seems to insinuate that Agrippa died before Augustus. In the will of the emperor, made sixteen months before his own decease, he made no mention of this grandson; but nothing can be built on this omission. Tacitus and Suetonius both agree that the centurion reported to Tiberius, "Factum esse quæ imperâsset," and that Tiberius replied with anger, "Neque imperasse se, et rationem facti reddendam apud senatum;" but took no further notice of the affair. See Tac. *Ann.* i. 6.; Suet. *Tib.* 22.; Dion, lvii. 3.

[2] Suet. *Tib.* 23.: "Jure tribunitiæ potestatis coacto senatu."

came forward, as the first magistrates of the republic, to swear obedience to him as their imperator, and the formula was repeated by all the officers of the state, and echoed by the soldiers and the citizens.[1] The ceremony passed smoothly without demur or scruple. Tiberius alone, perhaps, was astonished at the readiness with which his fellow-citizens accepted from the lips of their magistrates the obligation to maintain the imperial system in his person. The terms in which he had convoked the fathers had been studiously moderate and cautious. He had carefully avoided committing himself to any personal views: he had only requested that they should consult about the honours due to the deceased; while for himself he proposed to continue meanwhile in attendance on the venerated remains, the sole public function which he claimed the right to discharge. Yet he had not scrupled to assume the ordinary ensigns of power at the emperor's death-bed, he had disposed the sentinels and given the watch-word without reserve; even in presenting himself in the forum and the senate he had adopted a military escort: still more, he had despatched his own orders to the legions in the provinces; in short, he had shown no signs of hesitation in anything but his address to the senators themselves.[2] As associated indeed in the imperium he was perfectly competent

Tiberius convenes the senate.

[1] Tac. *Ann.* i. 7.: "Primi Coss. in verba Tiberii Cæsaris juravere." In the camp from which the usage was derived the legatus Imperatoris first uttered the oath of obedience—"præstitit sacramentum"—to his general; then the centurions, and finally, the soldiers—"jurabant in verba legati"—took his oath upon themselves. But the military sacrament had now become a general oath of allegiance, which the consuls proposed, and the rest of the citizens repeated after them. Comp. Suet. *Jul.* 84.; Appian, *Bell. Civ.* ii. 145.

[2] Tac. *Ann. l. c.*: "Defuncto Augusto signum prætoriis cohortibus ut imperator dederat; excubiæ, arma, cætera militiæ; miles in Forum miles in Curiam comitabatur; literas ad exercitus, tanquam adepto principatu, misit; nusquam cunctabundus nisi quum in Senatu loqueretur." Comp. Suet. *Tib.* 24.; Dion, lvii. 2.

to take these military measures; but the motive which impelled him to act so promptly was his fear of Germanicus, the commander of several legions and the favourite of the people, who, it might be apprehended, would rather choose to seize the supreme power at once than wait for its descent to him hereafter.[1] Tiberius had a further reason for courting the suffrages of the senate, rather than commanding them: he was anxious to appear to owe his election to the national voice, rather than slip into the succession as the adopted heir of a woman-ruled dotard. It suited his temper, moreover—and in estimating the acts of the moody Tiberius we must regard his temper even more than his policy—thus to ascertain the real sentiments of the courtiers, whose voices he could have easily constrained.

Private testament of Augustus.

Already, sixteen months before his death, Augustus had sealed his will, and placed it beyond his own reach in the custody of the Vestals.[2] By this instrument he had made a careful disposition of his property, after the manner of a private citizen. The bulk of it he had bequeathed, after expressing his regret at the loss of Caius and Lucius, to Tiberius and Livia in unequal proportions, the former receiving two-thirds, the latter one-third only; but even this share was beyond what the law allowed to a widow, and required a special exemption from the senate.[3] It was provided at the same time that Livia should be adopted into the Julian family and distinguished with the title of Augusta. In

[1] Tac. *l. c*: "Causa præcipua ex formidine ne Germanicus, in cujus manu tot legiones, immensa sociorum auxilia, mirus apud populum favor, habere imperium quam exspectare mallet."

[2] Suet. *Oct.* 101.; Tac. *Ann.* i. 8.; Dion, lvi. 32, 33.

[3] The lex Voconia had allowed a widow to inherit only a fourth, and this had been reduced to a fifth by the lex Papia Poppæa. It may be said, however, that Livia had been released from the severity of this law by receiving the Jus trium liberorum. Dion, lv. 2. See Reimar's note on Dion, lvi. 32.

default of the survival of these his first-named heirs, he called his grandsons and their children to the inheritance, one-third of which was to descend to Drusus, the son of Tiberius, the remainder to be apportioned among Germanicus and his three male children. The unfortunate Julias were specially excepted from all benefit in this arrangement, and a clause was added by which their remains were forbidden to rest in the Cæsarean mausoleum. Of Agrippa Postumus no mention seems to have been made. Failing all natural or adoptive successors, the emperor had taken the precaution of inserting some names of the chief nobility, even such as he was known to have regarded during his lifetime with distrust and dislike, either to conciliate their favour towards his descendants, or as an empty display of generosity. But the property which, after fifty years of power, the emperor had to bestow, did not exceed what might be expected from a citizen of the first rank; and it was burdened by liberal donations to the public treasury, to the citizens individually, to the legionaries and the guards of the palace, and also to a few private friends.[1] As regarded public affairs, the last counsels he gave his children and the commonwealth were exhortations to prudence and moderation. He requested that no ostentation of magnificence should induce them to emancipate many slaves at his funeral; that they should abstain from admitting the subjects of the empire indiscriminately to the honours and privileges of the ruling race; that they should summon all men capable of affairs to a share in their administration, and not accumulate all public functions in a single hand; lastly, that they should rest satisfied with the actual extent of the frontiers, nor risk, by the lust of further conquests, the loss of the

Last public counsels.

[1] Tac. *l. c.*: "Populo et plebi cccexxxv.. prætoriarum cohortium militibus singula nummum millia, legionariis ccc., cohortibus civium Rom. cccc. nummos viritim dedit."

provinces they possessed: for so he had paused himself in the career of his own successes, and preferred to present gain or personal glory the permanent interests of the republic.[1]

Funeral honours decreed him.

Tiberius was anxious that the citizens should notice the deference paid by the deceased ruler to their presumed supremacy, and fancy that the empire, with its various powers and prerogatives, was still their own to give or to withhold. The senate and people vied in the honours they heaped on the memory of so loyal a sovereign. The body, it was decreed, should be borne into the field of Mars through the gate of triumph, but Tiberius himself interfered to moderate the officious zeal of individual courtiers. The populace signified their resolve to consume the remains in the forum, and an armed guard was required to prevent this irregularity, to avert the riots which might have ensued, and spare the superstitious feelings which would be hurt by it. But the vapid admiration of the sated sight-seers of Rome was finally contented with the decorous solemnities of a national apotheosis. The senate, the same body, at least in name, which had struck down another Cæsar sixty years before, which had conceded honours to his corpse under bitter compulsion, and driven his adorers from his shrine with blows and menaces, now combined with all classes of the citizens in a common act of extravagant adulation. The procession of the knights who attended on the bier held its march from the suburban station of Bovillæ to the centre of the city; orations in praise of the deceased were pronounced by Tiberius and his

[1] Dion, lvi. 33. These counsels seem to have been appended to the register of the empire (its forces, revenues, &c.), which Augustus bequeathed to the state. Tac. *Ann.* i. 11.: "Proferri libellum recitariique jussit: opes publicæ continebantur, &c. . . . . addideratque consilium coercendi intra terminos imperii." See vol. iv. chap. xxxix. It was still a question, however, whether this last advice was the result of care for the public weal, or of envy towards his successor.

son Drusus from the steps of the Julian temple and from the rostra; from the forum the honoured remains were borne upon the shoulders of the senators to the place of cremation in the Campus Martius. Temples, priests, and holy observances were decreed to the divine Augustus, as before to the divine Julius, for a prætor was found to affirm that he had seen his soul ascend from his ashes into the celestial abodes. This testimony, such as it was, followed an ancient and auspicious precedent, and was rewarded with a splendid present from Livia.[1] On the death of Cæsar, no such vision had been required: Rome and the world believed without a witness, that a spirit more than human had exchanged life for immortality.

Tiberius in the senate.

Meanwhile a scene was being enacted in the Senate House of much more importance to the interests of the citizens than that which concerned the remains of fallen greatness just consigned to the tomb. Tiberius had learnt from the policy of his sire that, however bold and decided his movements might be, in the camp and the provinces, he must govern the nobles in the city by craft and management. Following implicitly the example which had been set him on more than one solemn occasion, he now met the professions of submission to his authority, which the senators eagerly tendered, with pretending to shrink from its acceptance. He began with uttering ambiguous generalities about the vast extent of the empire, and the arduousness of the task of governing it.[2] From thence he proceeded to insinuate that the charge was in fact too great for a single hand, and might tax the powers of more than one associate. He hinted, perhaps, at the policy of appointing a third triumvirate, to divide the cares to

[1] Suet. *Oct.* 100.; Dion, lvi. 46.

[2] Vell. ii. 124.: "Veluti luctatio civitatis fuit pugnantis cum Cæsare senatus populique, ut stationi paternæ succederet; illius ut potius æqualem civem quam eminentem liceret agere principem."

which Augustus had alone been equal; as it had required the vigour of three combined imperators to wield the sword of Cæsar. He was not unaware that among the traditions of the republic the triumvirate was more obnoxious than even the monarchy, and he might anticipate that the fear of returning to a rule stamped with the fatal impress of massacre and civil war, would throw his hearers on the only other feasible alternative, the perpetuation of imperial supremacy. The senators received his harangue in silence, rather from uncertainty as to his real wishes than from any hesitation of their own; for with the exception of the few among them who might cherish schemes of personal aggrandisement, there can be no doubt that the general disposition was to acquiesce, however reluctantly, in the substitution of Tiberius for Augustus. But the smooth progress of the trick was presently interrupted by the captious question of Asinius, who ventured to ask the speaker what part of the imperial functions he was prepared himself to accept. Tiberius was for a moment embarrassed; but recovering himself, he replied adroitly, that it was not for him to choose or to reject any particular charge, when for his own part he would willingly be excused from all. The rash or petulant inquirer sought to cover his retreat by declaring he had no other motive in asking, but to show by the answer he should elicit that the state was one and indivisible, and could only be governed by a single head. The session ended with the understanding of all parties that the government should continue in the hands of Tiberius, with all the functions amassed by his predecessor.[1] No formal decree, however, was pronounced to this effect;

All the functions of empire left by tacit understanding in the hands of Tiberius.

[1] Tac. *Ann.* i. 11—13.; Suet. *Tib.* 24.; comp. Dion, lvii. 2. That there was no regular decree on this occasion, as was usual in later times, for conferring the imperial prerogatives, appears from the fact that Tacitus and Suetonius are not agreed as to the turn the discus-

he already possessed the imperium, which required no further intsrument to give him the control of the legions and provinces; the tribunitian and proconsular power had been granted on a previous occasion, and the prerogatives of the consular were sufficiently understood without a distinct and formal recognition. The principate was, perhaps, virtually conferred without a special act, by tacitly yielding the first voice in the senate, while the popular suffrage, in which lay the disposal of the chief pontificate, might be easily taken for granted. The time had come when, whatever artifices might still be required for the management of the senate, the chief of the state need keep terms no longer with the popular assemblies. The appointment of the consuls, with the forms of voting, was now finally withdrawn from the centuries, and therewith the last frail remnant of the political privileges of the Roman people was substantially abolished. The emperor henceforth nominated four candidates, and allowed the senate simply to make choice of two among them; but the aspirants for honour were no longer subjected to the humiliation of suing, or the pain of being refused, and the express recommendation of the emperor himself was considered as in fact authoritative. The senators accepted with gratitude the relief from a delicate and invidious responsibility, and the people submitted to the change with scarce an audible murmur.[1]

The last political privileges of the people abolished.

sion ultimately took: the former gives us to understand that Tiberius broke up the meeting without any specific declaration of assuming the empire; but Suetonius says, expressly, that he agreed to undertake the charge, at least for a season.

[1] Tac. *Ann.* i. 15.: "Tum primum a campo comitia ad Patres translata sunt," etc.; but at the close of this book (c. 81.) the same author remarks, in apparent contradiction to this statement, "De comitiis consularibus, quæ tum primum illo principe ac deinceps fuere, vix quidquam firmare ausim," etc. The subject will be treated more fully in a subsequent chapter.

Discontent of the legions in Pannonia.

While the supreme power was thus quietly changing hands at the centre of the empire, events of no little moment were happening on the frontiers, where the seeds of future revolutions were sown by a mutinous soldiery. The insubordination which Cæsar had experienced more than once among his own legionaries, was the effect of his indiscriminate enlistments, and the licentious principles he had instilled into his followers. The three legions which now occupied Pannonia under Julius Blæsus were composed in a great measure of recruits promiscuously levied to repress the recent revolt. Though among these many veterans were mingled, it seems impossible that the complaints they put forth of having served thirty or even forty years without obtaining their discharge, could have been true of any large number. Harassed as the actual veterans may have been by a service protracted, under the necessities of the times, far beyond the legitimate period, we may conjecture that the turbulence of the recent levies had given an impulse to their dissatisfaction. They complained of their wounds and privations; of the intolerable harshness of camp discipline; of the meagreness of their daily dole; of the miserable and distant recompense of allotments on a barbarous frontier. The few days of rest or rejoicing which the legate allowed them, on the confirmation of the empire to Tiberius, were occupied by the most ardent spirits in fanning the sparks of sedition; yet it must be observed, that among all their murmurs, they never pretended that the death of Augustus released them from their legitimate subjection to his associate.[1]

Drusus is sent to quell the mutiny.

The authority of Blæsus was soon overthrown. The troops insisted that the term of their service should be definitely fixed at sixteen

[1] Tac. *Ann.* i. 16.

years.[1] They demanded also a further advance in the rate of the legionary's pay, which Julius Cæsar had already raised to double the earlier standard of the republic.[2] The legatus was compelled to send his son to Rome as the bearer of these requisitions, which wore the character of a defiance, for the Roman in the camp lost every right of the freeman; his only patron was the tribune in the Forum, his sole means of redress his vote in the Comitia. Nor while awaiting a reply from the emperor and senate, did the soldiers return frankly to obedience. Conscious of the crime of indiscipline, they broke into frenzies of anger and jealousy, struck or slew their centurions, and insulted their commanders. Drusus, being despatched promptly with some prætorian cohorts to recover their fidelity, found them in open mutiny, occupying their camp and drawing their rations, but refusing every work and exercise. The prince was furnished with no definite instructions; his father had withheld from him the requisite authority for conceding demands which he still hoped to evade. The soldiers were infuriated at this disappointment. Drusus was actually attacked by tumultuary bands and with diffi-

[1] Hitherto the term of service for the legionary was twenty years, and sixteen for the prætorian, the name by which the guards of the emperor's person, and tent or palace, came now to be distinguished. But even at the end of that period Augustus had introduced the custom of exauctoratio, by which the legionaries were relieved from some of the more severe duties of the service, but still retained under their colours, instead of missio or complete discharge.

[2] The soldiers demanded the denarius per day instead of the ten ases. The denarius had been raised to the value of sixteen, or, as some say, twelve ases, and such was apparently the increased demand. But if I understand Pliny rightly, this point they never actually gained: the denarius continuing always to be counted as ten ases in military payments. *Hist. Nat.* xxxiii. 3. "Denarium in militari stipendio semper pro x assibus datum." But the whole question is involved in great difficulty. See Lipsius, Excurs. vi. and vii. in Tac. and the notes of Walther, Ritter, and other commentators.

culty rescued; night intervened, but the morning seemed about to dawn on the entire defection of three legions. Suddenly the moon became eclipsed, and before it emerged from the ominous shadow, clouds had gathered in the sky, and seemed, to the affrighted and ignorant multitude, to threaten its total extinction. The men were struck with dismay; and while the fit of fear or remorse was upon them, Drusus seized the moment for promises and caresses. In return for some vague assurances of redress from the emperor, he engaged them to surrender their ringleaders, on whom he inflicted the full vengeance of outraged discipline, with the consent and approbation of the fickle multitude.[1]

Insubordination among the legions on the Rhine.

Almost at the same moment, and from similar motives of discontent, a mutiny had broken out also among the legions on the Rhine. The danger was far greater in this case than in the other; the army of the Rhenish frontier numbered not less than eight legions, posted in two divisions in the Upper and Lower Germania; and the direction of the entire force was intrusted to Germanicus, as commanding in chief throughout the whole province of Gaul. Not only did the mutineers clamour for higher pay and more indulgent treatment, but the legions of the lower province proclaimed that they would carry the youthful Cæsar in triumph to Rome, and gird him with the sword of their deceased leader. They obtained complete mastery over their officers, and the legate Aulus Cæcina; and their outbreak was scarcely kept in check by the yet undecided attitude of the upper division, which C. Silius still restrained from open mutiny. Germanicus was absent at Lugdunum, where he was presiding over the census of the Gaulish states. Here he received

[1] Tac. *Ann.* i. 16—30.: "Promptum ad asperiora ingenium Druso erat: vocatos Vibulenum et Percennium interfici jubet." But could any commander have done otherwise?

the news of the late emperor's death, with orders from Tiberius to tender to the provincials the oath of allegiance to the elect of the senate. This duty he was intent on discharging, without apprehension of any military outbreak, when the report of the state of affairs in his camp interrupted his proceedings. The soldiers had assailed their officers with violence; they had murdered tribunes and centurions; obedience was at an end, and the legate himself was constrained to deliver into their hands the objects of their bitterest hatred.[1]

Germanicus hastens from Lugdunum to suppress it.

The Roman quarters among the Ubii had been for some days in a state of confusion and anarchy, when Germanicus arrived and threw himself boldly into the midst. The young Cæsar was personally adored by the soldiers; nor, had it been otherwise, were any of them prepared to discard the authority of a scion of the imperial house. On his appearance among them they cast themselves at his feet, imploring his sympathy with their just complaints, the most aged of the veterans seizing his hands, it was said, and thrusting them, as if to kiss them, within their lips, that he might feel their toothless gums, and learn to appreciate the length of their ill-requited services. Some showed him the scars of their wounds, others the marks of the centurion's vine-rod. The men soon lashed themselves into fresh fury, and with loud cries adjured Germanicus to lead them straight to Rome, and assume the empire under their protection. The young Cæsar shrank with horror from such a treason, and possibly they might in their frenzy have done violence to his person had not his attendants snatched him hastily from their grasp. But meanwhile their emissaries were soliciting the adhesion of the legions of the Upper Germania, stationed at Moguntiacum;

[1] Tac. *Ann.* i. 31, 32.; Suet. *Tib.* 25.; Dion, lvii. 5.

and while undecided as to their ultimate objects, they already talked of commencing their rebellion by the plunder of the Ubii and the cities of Gaul. The military chiefs were well aware that this dissolution of discipline on the frontier would bring the Germans immediately across it, and the civil war which must ensue between the faithful allies of Rome and her own insurgent children would be aggravated by foreign invasion, and possibly by provincial revolt. Assembled in the imperator's tent, they hastily concerted an offer of terms to the soldiers, to which they pledged the name of Tiberius himself. Besides the required revision of the term of service, ample donatives in money were promised, as soon as the legions should return to winter quarters. This was not enough. The insurgents demanded that the stipulated sum should be paid down on the instant, and the private coffers of Germanicus and his officers, as well as of the emperor himself, were ransacked to satisfy them.[1]

The popularity of Germanicus, and his success in quelling the mutiny.

This sacrifice was after all unavailing. The appearance of envoys from the senate, charged to examine the soldiers' demands, was the signal for a fresh disturbance; for the alarm quickly spread that the concessions made on the spur of momentary danger would fail to be ratified on maturer deliberation. The more violent of the mutineers persuaded their comrades to refuse all accommodation, and so formidable was the attitude now assumed, that Germanicus was forced to surrender the eagles to the keeping of the rebellious legionaries, and in fact to relinquish the command. At most he could only secure a retreat for the envoys, on whom the fury of the insurgents was about to fall, and at the same time for his wife and children, whom he was anxious to remove to a place of safety.

[1] Tac. *Ann.* i. 34—36.

Agrippina, a woman of masculine spirit and devoted to her husband, could hardly be persuaded to quit his side. When she at last took leave, with a few female attendants, carrying in her arms her infant child Caius, the pet and playfellow of the soldiers, the feelings of the spectators were moved to remorse. Germanicus seized the moment to remind them of the claims of his own family upon them, and of the love they had borne to his father Drusus; nor did he fail to recall to remembrance the glories of Augustus, the victories of Tiberius, and the spirit with which the immortal Julius had quelled the mutiny of his soldiers by addressing them as *citizens*. This last passionate appeal proved successful. The insurgents fell on their knees, and implored him to punish the guilty, to spare the penitent, and lead the pardoned host directly against the enemy. They conjured him to recall his wife and child, and not leave them as hostages in the land of the Gauls, but retain them under the safeguard of the Roman legions. Nor did they fail to deliver of their own accord to the punishment of the axe and rod those whom they regarded as their ringleaders, whom their officers gladly left it to themselves to point out. The ferocious zeal with which each offender denounced such as he chose to think more guilty than himself presents a fearful picture of human passion.[1]

Character of Germanicus.

When we meet among the scions of the imperial house with one described as eminently virtuous and noble, we must prepare to hear that his career was melancholy, that his promise ended in disappointment, and his death was premature. Such a death at least doubly gilds his virtues, while it may anticipate the development of crimes or vices. Of all the chiefs of Roman history, none has been represented in fairer colours than the ill-fated

[1] Tac. *Ann.* i. 37—44.

Germanicus. We have seen already that he was the nephew of Tiberius, being the son of the gallant Drusus, whose title he was permitted to inherit, by a daughter of the triumvir Antonius.[1] Augustus had connected him still more closely with himself, by uniting him to the child of Agrippa by his own daughter Julia. Adopted by Tiberius, he was placed on the same line of succession as his cousin Drusus, to whom he was two or three years senior; and after the deaths of Caius and Lucius Cæsar, who had shone so briefly as twin stars in the firmament, the fortunes of the two adopted brothers seemed to rise together in auspicious conjunction.[2] Whatever brilliant future might be in store for Germanicus, the Romans, if we may believe their posthumous testimony to his merits, were fully persuaded that he deserved it. His natural abilities had been carefully cultivated. He had been trained equally in the art of war and the exercise of civil employment. His first laurels had been gained in his twenty-second year, in the wars of Pannonia and Dalmatia, the successful issue of which was in a great measure ascribed to his energy and conduct.[3] In the year 765 he had been summoned to the consulship, and in the highest rank of magistracy, young as he was, his countrymen had marked in him all the skill in affairs which is commonly attained only by experience. The government of the Gaulish provinces, too extensive a command to be entitled a mere proconsulate, followed on the expiration of his functions in the city; and there, at the head of eight legions, before the most formidable opponents of the Roman power, he stood in the eyes

[1] Suet, *Claud.* 1.; *Calig.* 1.; Plut. *Anton.* 87.

[2] Germanicus, born in September 739 (see vol. iv., ch. xxxviii.), was now, at the close of 767, in his twenty-ninth year. The date of the birth of Drusus is not accurately known; it was probably a short time before the separation of Tiberius from his mother Vipsania, in 742.

[3] Dion, lvi. 15. See above.

of the soldiers and provincials as little less than an emperor himself. The large training of the highest Roman education had fitted him, amidst these public avocations, to take a graceful interest in literature. His compositions in Greek and Latin verse were varied, and perhaps more than respectable for school exercises, with which only they should be compared.[1] Nor did he neglect the practice of oratory, which he employed, as was always especially recorded of those whose memory the Romans delighted to honour, in the defence rather than the prosecution of the accused.[2] His manners were eminently *civil* both at home and abroad, such as became the son of the man who, according to the fond belief of the citizens, would have restored the commonwealth; and while he comported himself towards his countrymen as an equal, his demeanour to foreigners and allies was affable and condescending. In the camp his behaviour was in striking contrast both with the reserve of Augustus and the mal-address of Tiberius. He lived freely among his soldiers, whose humours he sought to flatter, like the first and greatest of the Cæsars, by sympathy and kindness. When he explored his men's sentiments on the eve of a perilous undertaking, by traversing their quarters disguised at night, he might hear his own merits made the theme of their conversation, and assure himself of the confidence they reposed in his valour and fortune.[3]

[1] The Greek comedy of Germanicus (Suet. *Calig.* 3.) was probably a mere scholastic imitation, such as was generally the character of the Greek verses of the young Roman nobles. The translation of Aratus which is, I think properly, ascribed to him, was a *tour de force*, to which we can hardly attach any practical use, though even Cicero occupied himself *in* a similar version of the poet of astronomy. But Ovid solicits his patronage for the most learned of his own works, at a time when such applications were not merely compliments. *Fast.* i. init. Comp. *Ex Pont.* iv. 8. 67.

[2] Suet. *l. c.*; Dion, lvi. 26.; Ovid. *Fast.* i. 21.:

"Quæ sit enim culti facundia sensimus oris,
Civica pro trepidis cum tulit arma reis."

[3] Tac. *Ann.* ii. 13. The occasion will be specified below.

His popularity with all classes, especially with the soldiers, was fully shared by his consort. The greatest praise they could bestow on a woman was to liken her to the Roman matrons of a hallowed antiquity, and to bless her for her love to her husband, and the fertility which they hailed as its surest token.[1]

Jealousy of Tiberius.

The strong contrast which the character of Germanicus thus presented to that of his uncle might have given cause for jealousy and distrust even in a private family: between members of a ruling dynasty, the course and succession of which were established on known and long-respected principles, it would have led no doubt to estrangement and mutual dislike; but the misfortune of Tiberius and his nephew lay in the vagueness of the title by which the one enjoyed power, and the other might be expected to aspire to it. The claim of Julius Cæsar to reign over the Romans was emphatically that of the worthiest. He founded his usurpation on the virtual presumption that the republic required a chief, and he was himself the fittest to become such. It was the aim of Augustus, of which he never lost sight for a moment, to strengthen his human right as the heir of Julius by the divine right, to which he also pretended, of moral fitness. This human right, if I may so call it, of inheritance might be strengthened in the third descent; but Tiberius, painfully alive to his own deficiencies, and conscious of no personal claim to the reverence of his countrymen, felt that the divine right no longer pertained to him, and was constantly harassed by the apprehension that the Romans, still looking for the

[1] Agrippina bore her husband nine children, of whom three died in infancy, the others, three sons and as many daughters, survived their father, and will all find a place in these pages. Suet. *Calig.* 7. With regard to one who died in childhood, a pleasing trait is recorded of Augustus: "Insigni festivitate, cujus effigiem habitu Cupidinis in æde Capitolinæ Veneris Livia dedicavit, Augustus in cubiculo suo positam, quotiescunque introiret, exosculabatur."

worthiest to reign over them, would turn from him to the younger scion of the worthiest of Roman houses. Every despot is discontented at being outshone by the rising glories of his presumptive successor; but few have the excuse of the unfortunate Tiberius, who felt that every laurel placed on the brow of Germanicus constituted a claim, not to succeed him on the throne, but to eject him from it. Other usurpers have stepped at once within the circle of admitted principles of descent. The subjects of a Napoleon or a Cromwell were familiar with the idea of dynastic sovereignty; but it was otherwise with the children of the old Roman republic. The Cæsars had every rule and principle of monarchy to create; and it was not till they had established the rights of legitimacy, that the emperors could feel the personal security, which was the best guarantee for their temperate exercise of power. The mutiny of the German legions revealed to Tiberius a secret of fatal significance. The cries of the legionaries, *Cæsar Germanicus will not endure to be a subject*, confirmed the presentiment of his own self-disparaging conscience.[1]

He determines to employ the discontented soldiers.

After all, this distrust of his own abilities, which were certainly considerable, was the great and fatal defect in the character of the self-tormentor. The state of pupilage in which he had been held by Augustus may account perhaps for this self-disparagement, and for the meanness with which he ultimately threw himself on the support of a favourite far less able than himself. The trifling results of his own last campaign in Germany made him the more jealous of the plans now urged by Germanicus for the entire subjugation of the insolent victors of Teutoburg. Yet it was more than ever necessary to employ the discontented legions,

[1] Tac. *Ann.* i. 31.: "Magna spe fore ut Germanicus Cæsar imperium alterius pati nequiret."

who had placed themselves without reserve under their young Cæsar's orders, and to precipitate them headlong on the Elbe was the surest way of averting a march upon the Tiber. The soldiers themselves were burning for occupation: they were anxious to wash out in blood the stain of mutiny which ever left a dark and burning spot on the conscience of the Roman legionary.

His artifice in dealing with them.

During the crisis of these military outbreaks, the emperor's conduct was marked by consummate artifice and caution. He successfully evaded binding himself to any precise stipulation by which his supreme authority could be compromised, while he allowed his son and nephew to treat with the mutineers, and amuse them with specious hopes beyond their power to confirm.[1] His advisers at Rome urged him to go in person and quell the sedition by the majesty of his presence, as, until the latest periods of his reign, Augustus, on every great emergency, had quitted the city for the provinces. Always professing to be about to take some decided step, Tiberius continued to allege excuses for indecision and inactivity. He was aware that at Rome he was supported by the name and influence of the senate, which as a body was entirely devoted to the imperial government. In the camp, on the contrary, he knew not on whom he might depend, or how far the traditions of military allegiance still retained their potency. By remaining within the precincts of the city he could escape direct comparison with Drusus and Germanicus, from which he shrank with the instinct of self-distrust; and there he was under the protection of the armed force of

[1] The cry for a sixteen years' service seems to have been listened to, but Tiberius soon afterwards took occasion to disregard his concession, and fixed twenty years for the regular legionary term. Tac. *Ann.* i. 78.: "Ita proximæ seditionis mala consulta . . . . abolita in posterum."

the capital, which at the moment of assuming power he had bound to his service by the most solemn formulas. Moreover, his own jealous nature suggested that to whichever of the two camps, the Pannonian or the German, he should repair, he might awaken the jealousy of the other. Finally he argued, it rather befitted the majesty of the imperial power to judge of the complaints of its subjects at a distance, than to wrangle with them on the spot. Nevertheless, to break the force of the petulant murmurs which assailed him, Tiberius pretended to have resolved to quit Rome for the frontiers, and caused preparations to be made for his anticipated departure. But, first the winter season, and when that was past, the pressure of business at home, still furnished him with pleas for delay. His own ministers and intimates were long deceived as to his real intentions, the citizens still longer, and longest of all the provinces themselves.[1] Meanwhile he was anxious to court the good opinion of the senators by the general conduct of his administration at home. In matters of personal concern he rivalled and even exceeded the moderation of Augustus himself. He interposed with specious words to restrain the extravagant compliments showered on him by the nobles, and checked the servile impatience with which they pressed forward to swear obedience to his enactments, not only past but future. In the senate, he suffered all men to discuss his measures with freedom, and propose motions of their own, on which he was often among the last to declare his sentiments. He was proud of the appellation of Prince, but would not endure to be addressed as Imperator or Dominus.[2] While he en-

Policy of Tiberius in the senate.

[1] Tac. *Ann.* i. 47.: "Ceterum, ut jam jamque iturus, legit comites, conquisivit impedimenta, adornavit naves: mox hiemem aut negotia varie causatus, primo prudentes, dein vulgum, diutissime provincias fefellit."

[2] Dion. lvii. 7, 8.

couraged the appointment of priests, rituals, and games in honour of his deified predecessor, he vehemently repelled the preposterous adoration proffered to himself by citizens or provincials. Yet the moderation of Tiberius was simply politic, and was tinged by no ray of generosity or clemency. The hapless Ovid he suffered still to languish in the exile from which neither entreaties nor flatteries availed to release him.[1] The lapse of fifteen years had not softened his spite against his miserable consort, who was now treated with even increased rigour in her confinement at Rhegium, till she sank under her sorrows and possibly under the most cruel privations, in the first months of her husband's elevation.[2] Her paramour, Sempronius Gracchus, retained in an island off the coast of Africa during the lifetime of Augustus, was slain by one of the earliest mandates of his successor. The only trait of gentleness the new ruler exhibited was in his behaviour to his mother, whom he never ceased to regard with respect and even with awe, allowing himself to be guided or thwarted by her to the last, with the docility of his childish years.[3] Nevertheless, though he suffered Livia to assume great authority over himself, he strictly forbade, as a Roman matron, her taking any ostensible share in public affairs, and curtailed the excessive honours the senate would have lavished upon her.

Germanicus leads the legions across the Rhine.

But we must return from Rome to the frontiers once more, with the historian Tacitus, and follow the culminating star of the hero Germanicus. No sooner had he quelled

[1] The date of Ovid's death, "æt. 60," may range between April 770 and April 771.

[2] Tac. *Ann.* i. 53. The death of the elder Julia is placed by this writer within the year 767, which embraced little more than three months of the new principate. Yet he speaks of her death as the result of the long and deliberate severities of the new emperor: "Inopia ac tabe longa peremit, obscuram fore necem longinquitate exilii ratus."

[3] Dion, lvii. 12.

the sedition in his camp, than the young Cæsar, postponing to a fitter moment the business of the census at Lugdunum, transported his impatient soldiers across the Rhine, and promised them an opportunity of effacing the stain of disaffection in the blood of the national enemies. The slaughter of Varus was yet unavenged, and the last incursion of Tiberius had failed to restore the authority of the empire on the right bank of the river. An attempt, indeed, had been made to define the frontier of a Transrhenane province between the Lippe and the Ruhr by the line of the Cæsian forest, and a supplemental rampart of wood and earth; but this work had been left incomplete, and Germanicus now cut his way through it without hesitation.[1] He was resolved to place the bulwarks of the Roman empire much farther to the east. Dividing his forces into four corps (wedges the Romans called them, and the name was well applied to the service in which they were employed, of breaking their way through every obstacle, and splitting to the heart the vast region before them), he swept a large extent of territory with fire and sword, and startled from their lairs the warriors of many formidable nations. The Marsi, whom he first reached, were taken unprepared, and made to suffer severely; the Bructeri, Tubantes, and Usipetes retreated before him, or evaded his onset, and wide as he spread his battalions he could not force them to join battle. Harassed on the flanks and rear, it was only by a great effort that he succeeded in shaking off the enemy whom he could not assail, and eventually bringing back his troops with no great loss to their winter quarters. This incur-

[1] Tac. *Ann.* i. 50.: "Propero agmine sylvam Cæsiam, limitemque a Tiberio cœptum, scindit." "Of the Cæsian forest nothing is known except from this passage. It extended probably along the right bank of the Rhine between the streams mentioned in the text, and the lines commenced by Tiberius were a rampart of earth and palisades beyond it."

sion, it must be remembered, was made towards the close of the year, when he could not expect to obtain any considerable results. Tiberius, it is said, received the account of these proceedings with mixed feelings. The suppression of the mutiny relieved him from anxiety; but he was far from satisfied with the sacrifice, as he deemed it, of dignity, and the compromise of state principles by which it had been achieved.[1] Nevertheless he consented to sanction the pledges his son and nephew had given; and in addressing the senate he enlarged on the merits of Germanicus, while he affected to speak with modest reserve on those of his own son Drusus. Nor did he fail to crown the trifling exploits of this desultory incursion with the honour of a triumph, the celebration of which, however, was to be deferred till the conclusion of the war, and the anticipated conquest of Germany.

Renewed operations of Germanicus. A. D. 15. A. U. 768.

In the following year, A. D. 768, Germanicus recommenced his operations at an earlier season, and with more definite plans. He had equipped a force of eight legions for the field, with perhaps an equal number of auxiliaries and irregular skirmishers; four of these legions were directed to cross the Rhine from the great camp at Vetera, under the command of the able and experienced Cæcina, and penetrate into the territory of the Cherusci; the other four were led by the Cæsar himself into the district of the Taunus, and were destined to keep in check the Chatti, whose powerful confederation was ever ready to harass the flank of a Roman armament in the north, or even to seize the opportunity of invading

[1] Tacitus adds (*Ann.* i. 52.) that he was mortified by the glory Germanicus acquired. It is possible that the young general's popularity at Rome caused his success to be magnified or extolled beyond its deserts. It was evidently far too slender to cause in itself any reasonable ground of jealousy.

the Gaulish province. The resistance opposed by the Chatti in the field was easily overcome. The Romans destroyed their stronghold, known by the name of Mattium; and having thus crippled their means of annoyance, returned to the Rhine, to co-operate in another direction with the expedition of Cæcina. The short interval which had elapsed since the defeat of Varus had sufficed to divide the victorious Cherusci into hostile parties. Segestes, the favourer of the Romans, besieged by his son-in-law Arminius, solicited their relief. He could offer, in return for their assistance, many spoils of the Varian disaster; and was able to deliver to them many noble women, the wives or children of the chiefs of his nation. Among these was Thusnelda, his own daughter, the consort of Arminius, a woman of high spirit, and more attached to the cause of her husband than that of her parent. These important hostages were transferred to the other side of the Rhine. The wife of Arminius was sent to Ravenna in Italy, where the child she bore him was bred in the fashions of his captors, and lived, we are told, to experience some sport of adverse fortune, the particulars of which have failed to descend to us.[1] The division to whom this easy success had fallen was recalled once more to the Roman quarters, and Tiberius himself conferred on Germanicus the title of imperator.

Germanicus revisits the scene of the slaughter of Varus.

Arminius and his faithful Cheruscans were exasperated at this treachery of their old chief, which seems indeed to have disgusted even those among them who would have laboured for a compromise between the hostile powers. The defection of Inguiomerus, a kinsman

[1] Tacitus related it in his Annals; and it must have found a place in one of the lost portions of that work, probably in the great lacuna in the fifth book, which refers to the date U. C. 784.: "Educatus Ravennæ puer quo mox ludibrio conflictatus sit in tempore memorabo." *Ann.* i. 58.

of Arminius, but one who had leant hitherto to the Roman side, convinced Germanicus that there was no longer room for craft and diplomacy, but that the whole of north Germany must be thoroughly subdued by the sword, or finally abandoned. The temporizing policy of Augustus, who hoped gradually to sap the spirit of liberty by the charm of Roman caresses, must now be regarded as a failure; insult and injury had exasperated the German chiefs beyond hope of reconciliation; arms alone could decide whether the empire should be extended to the Elbe, or restrained henceforth within the barrier of the Rhine. This was the result to which the young Cæsar's impetuosity had brought affairs on the frontier: it remained to be seen whether the same ardent spirit could effect the conquest of the people whom it had so thoroughly alienated. Towards the summer his plans were matured for a simultaneous attack in three directions on the Cherusci, as the head of a general confederacy. Cæcina was ordered to lead his force through the country of the Bructeri to the Ems; a body of cavalry was despatched by a more northerly route along the borders of the Frisii to the same destination; while Germanicus himself embarked with four legions, to coast the shores of the continent, and enter the river at its mouth. The three corps effected their junction with that precision to which the Romans had now attained by repeated experiments, having swept away all resistance throughout the region between the Lippe and the ocean, which their eagles had before scarcely penetrated. Cæcina had overthrown the Bructeri in an engagement of some magnitude, and had recovered the eagle of the nineteenth legion. The division of Germanicus ascended the waters of the Ems, or skirted its banks, till it reached the forest of Teutoburg, where it explored the vestiges of the great disaster after the lapse of six years, and

traced with mournful interest the remains of the camps of Varus, which showed by their diminished size and unfinished defences the failing strength and decreasing numbers of the flying force at each successive nightfall. The soldiers collected the bones of their slaughtered countrymen, still lying, some in heaps together, others scattered at unequal distances, and paid them funeral rites, erecting over the remains a monumental barrow, of which the Cæsar himself placed the first sod.[1] Advancing further, their excited feelings were relieved by an opportunity for action. Arminius had availed himself of the recesses of his forests to conceal a portion of his forces, and the Romans were too eager for the onset to take due precautions against surprise. The presence of mind of Germanicus saved them from a severe disaster; but though the victory remained at last undecided, it became prudent to withdraw from the field and retire to the stations already fortified on the Ems. From hence, on the approach of the winter season, they were led back to the frontier by the same routes by which they had advanced. Cæcina making his way through woods and marshes to the head of the causeway of Domitius was attacked by Arminius and reduced to perilous straits. Enclosed within his lines by overpowering numbers, he owed his deliverance to the rashness of the Germans, who once repulsed were easily thrown into confusion by a dexterous manœuvre. A great slaughter ensued among them, from which Arminius made his escape with some loss of honour. The Romans thus relieved continued their homeward march, and arrived in safety at Vetera, where the rumour of their surprise and destruction had already preceded them. The

Funeral honours paid to the remains of the slaughtered Romans.

[1] Tac. *Ann.* i. 61, 62.: "Cupido Cæsarem invadit solvendi suprema militibus ducique . . . . primum exstruendo tumulo cespitem Cæsar posuit."

residents of the left bank, in their alarm, would have broken their communications, and abandoned the fugitives to their fate, had not Agrippina shown herself worthy of her husband's and her father's courage. Placing herself at the head of the bridge, from which she refused to move, she awaited the return of the remnant of the rout; and as the long train of four unbroken legions defiled, with ensigns displayed, before her, she addressed them with the warmest acknowledgment of their deserts, her heart swelling with wifelike pride and emotion.[1]

Disaster of Germanicus on his return by sea.

The return of Germanicus himself was subjected to perils of another kind, and clouded with serious disasters. He had descended the Ems on board his vessels; but when he put out to sea, among the shallows of the Frisian coast, he found it necessary to lighten them. For this purpose he disembarked two legions, charging them to conduct their march homeward within sight of the ocean. Obeying these directions, however, too closely, a great number of the men were lost in the equinoctial tides, which overflowed the level shores, and swept away a large portion of their stores and baggage.[2] The main strength of the legions was at last collected once more in winter quarters; but to recruit them to their proper footing, and supply their full complement of horses and equipments, it was necessary to put under requisition, not the Rhenish provinces only, but the whole extent of Gaul, and even Spain and Italy. The collection of means of transport for such forces as the Roman generals moved year by year in these regions, over wide tracts of uncultivated heath or woodland, from which every vehicle and beast of burden was swept by the retreat-

[1] Tac. *Ann.* i. 69. The writer obtained this anecdote from the elder Pliny, who wrote an account of the German campaigns. Vetera Castra is the modern Xanten, nearly opposite to Wesel. Mannert. *Georgr.* iii. 431.

[2] Tac. *Ann.* i. 70.

ing natives, must have taxed to the utmost the resources of all the provinces of the West. The more we study the history of these expensive though fruitless campaigns, the more shall we admire the powers of the Roman government, the effective organization of every branch of its service, and the well-trained energies of all its officers, from the imperator to the centurion and primipile.[1]

Tiberius murmurs at the slender results of these campaigns.

It appears from this narrative that the success of Germanicus in these forays had been dubious at best. He had left no more solid monument of his prowess than the mound erected over the Varian remains; and this the natives indignantly levelled as soon as his back was turned. No fortress had been established to check the enemy's return into the tracts from which he had been for a moment dislodged; no roads had been formed to assist the advance of a future expedition; the savage mode of warfare which the invader had as usual permitted himself in ravaging the country with fire and sword, had made it not less untenable by Roman settlers than by its native possessors. Tiberius was far from satisfied with these results; and while he suffered the citizens to regard the surrender of Segestes and the capture of Thusnelda, the sole trophies of the campaign, as substantial tokens of success, for which not Germanicus only, but his lieutenants also, might deserve the triumphal insignia, he was at heart deeply vexed with the real failure of the year's exertions. His ill-humour vented itself in murmurs against his nephew's conduct, who had damped, he said, the courage of the legionaries by showing them the bloody traces of a Roman defeat; he even pretended that, in performing funeral rites, Germanicus had profaned the sanctity of his Augural

[1] Tac. *Ann.* 71.: "Ad supplenda exercitus damna certavere Galliæ, Hispaniæ, Italia; quod cuique promptum, arma, equos, aurum, offerentes."

office. He cavilled at the spirited movement of Agrippina, in which, he insinuated, she had overstepped the duties of her sex, to ingratiate herself with his legions. What would be left, he asked, for the imperators themselves to do, if their wives could venture to pass along the lines of the maniples, to approach the standards, and offer with their own hands largesses to the soldiers. He complained that the mutinous spirit of the army had been conjured by the intrigues of a woman, when the name of the chief of the commonwealth had failed to coerce it.[1]

The Romans offended at this jealousy.

The assumption of so ungracious an attitude towards the defenders of the national interests, in the midst of foreign foes and domestic sedition, was at best impolitic; the Romans regarded it, moreover, as unjust and base, and unworthy of the descendant of their magnanimous Cæsars. They ascribed it, however, less to the jealous temper of their ruler himself, than to the sinister influence of a low-born favourite, impatient of a rival's successes, who now prompted his master's apprehensions, and suggested the recall of Germanicus that he might no longer spend the blood and treasure of the empire in schemes for his own advancement, from which the nation derived no benefit.[2] This fatal adviser will be brought more formally on the stage at a later period: it is enough to say of him now that Tiberius listened with complacency to his questionable counsel. But the hesitation now becoming habitual with him in all public affairs still prevented him from acting upon it; while the young Cæsar, burning for martial fame, and equally unconscious, perhaps, both of the suspicions raised against him, and of the failure of his recent enterprise, was re-

[1] Tac. *Ann.* i. 69.: "Compressam a muliere seditionem, cui nomen Principis obsistere non quiverit."

[2] Tac. *l. c.*: "Accendebat hæc onerabatque Sejanus."

doubling his preparations for another campaign, and dreaming of more conclusive successes.[1]

Third campaign of Germanicus. A. D. 16. A. U. 769.

The failure of the last expedition was ascribed at the Roman quarters to no defect in the valour of the soldiers, or the skill of their chiefs, but simply to the natural difficulties of the route they had chosen, which lay further to the north, and was more embarrassed by swamps, forests, and broad rivers, than the regions with which the invaders acquainted themselves in their earlier operations. It may be supposed, moreover, that the inhospitable wilderness was exhausted of its scanty resources. Accordingly, Germanicus prepared a naval armament on a larger scale than before, which he collected in the island of the Rhine and Wahal, and directed through the channel of the lake Flevus to the ocean.[2] Before embarking, however, he sent his legate C. Silius, to make a demonstration against the Chatti in the south, and led himself a force of six legions along the valley of the Lippe, to secure the roads and strongholds, and provide for the defence and supply of his armies on their return.[3] This done he transported the main strength of his armaments in a thousand vessels, to the mouth of the Ems, thus saving them a great amount of time and fatigue. Leaving his ships at their anchorage under sufficient protection, he then directed his march towards the south-east, so as to strike the bank of the Weser at a spot where the Germans had assembled a large force. In the ranks of the invading army there was a brother of Arminius entrusted with a command, whose fidelity to the Romans was attested by the loss of an eye in their service, and by the surname of Flavius, which

He confronts the German forces on the Weser.

[1] Tac. *Ann.* ii. 5.

[2] He descended into this lake by the Fossa Drusiana, the channel which Drusus cut, as before mentioned, from the Rhine to the Yssel.

[3] Tac. *Ann.* ii. 6.

he had adopted as the client of a Roman officer. Arminius, we are told, demanded a parley with the renegade across the stream which divided the hostile arrays; and when, according to the agreement, they were left to converse alone, began by inquiring the occasion of his wound. Flavius specified the place and the engagement. '*And what*, demanded the other, *was your reward?—Increase of pay, a gold chain and chaplet, with other military distinctions*, was the reply. And when the German freeman retorted with a sneer on these *vile badges of servitude*, the Romanized Flavius continued unabashed to urge on him the obvious inducements to submission, such as the magnitude of the Roman power, the clemency of the emperor, the kindness with which his wife and child had been treated, and, on the other hand, the sure penalty of resistance. Arminius replied by appealing with fervour to the love of their country, the memory of their fathers, and the venerable names of their ancestral divinities: he contrasted with pride his own position, as the chief of his own people, with the subaltern rank of his recreant brother. From argument the debate was presently swayed to rebukes and mutual invectives, until, exasperated as they were, they would have plunged into the stream and decided their controversy in its waves had not the comrades of Flavius interfered and carried him away, leaving Arminius vainly defying with uplifted voice and hands the adversaries whom he could not reach.[1]

Germanicus explores the courage of his soldiers.

The next morning the Romans effected the passage of the Weser in the face of the enemy, not unwilling perhaps to give way, and draw them further into the heart of a thick jungle with a broad river in the rear. In the depths of a sacred forest the Germans had collected the forces of many nations, and were preparing to assail the

[1] Tac. *Ann.* ii. 9, 10.

invaders' camp by night. The imagination of our eloquent historian Tacitus kindles with the approaching catastrophe of the great epic of the German wars, and from the Homeric dialogue of his Flavius and Arminius, he proceeds to charm us with the night adventure of his hero Germanicus. Not trusting entirely to the reports of his brave but sanguine officers—and the spirit of flattery, he thought, might sway the representations of his personal attendants—the imperator resolved to explore, disguised, and at night, the real temper of the soldiers, and ascertain how far he might rely on the courage which had never yet been fairly confronted with the victors of the Teutoburg. Wrapt in his Gaulish bearskin, and attended by a single companion, he traversed the lanes of the camp and leant over the tent-ropes. The soldiers he found everywhere vying with one another in the praise of their young general: one boasted of his noble descent, another of his manly beauty; his patience, his kindness, his serene temper were in the mouths of all. To-morrow, they said, in the ranks, they would prove their gratitude and affection: they would sacrifice to vengeance and glory the faithless foe who had violated the peace of Rome. At this moment an emissary of Arminius riding to the foot of the rampart, proclaimed aloud in the Latin tongue his leader's promise of wives, lands, and a daily largess to all who would abandon the Roman service and take refuge in the ranks of freedom. The offer was received with shouts of indignant scorn. *Let but the day break*, exclaimed the legionaries, *let but battle be joined, and we will seize each for himself on wives and lands and plunder.* Germanicus withdrew well pleased with the result of his experiment, which was succeeded by a dream of favourable omen. The harangue he addressed next morning to his men contains a vivid description of the disadvantage under which the barbarian laboured, from

the size and weight of his weapons, his want of defensive armour, his slow and unwieldy motions, his ignorance of discipline, and impatience both of toil and pain. Everything that made him most terrible at first sight was found, when examined, an encumbrance and a defect. Encouraged and confirmed in their hopes and expectations, the Romans prepared cheerfully for the combat.[1] On the other hand, Arminius and his associates were not less prompt and energetic. Each at the head of his own people described the Roman army as the mere remnant of the Varian legions, the swiftest of foot, who had saved themselves once by flight from German vengeance: they were no other than the recreants of the Rhenish camps, who would rather rise against their own officers than rally in the face of the enemy. These, they said, were the slaves who had been reduced by stripes, the wretches who had skulked from pursuit of the brave Cherusci to the furthest shores of the ocean. Nor were the Germans suffered to forget how cruel and rapacious these ruffians had shown themselves in their moments of success: the freedom of the patriot warriors was the last possession left them; let them now defend it with their lives.[2]

Arminius encourages the Germans.

The position of the Germans occupied the declivity of the hills which bounded the valley of the Weser, extending into the broad plain at their foot and resting on a wood in the rear, which, from the absence of undergrowth, presented no obstacle to a retreat.[3] The Romans, however, having crossed the stream at various points,

Great battle and victory of the Romans.

[1] Tac. *Ann.* ii. 12, 13.

[2] Tac. *Ann.* ii. 14.

[3] Tacitus calls the spot "Campus cui Idistaviso nomen." There is no clue for identifying it. See the article on the word in Smith's *Dictionary of Geography*, in which Grimm is said to have shown that the plain was probably called Idisiaviso, that is, *the maiden's meadow*, from idisi, a maiden, and wiese, a meadow.

contrived by skilful movements to outflank their opponents; and while the cavalry gained the wood behind them, the main strength of the legions engaged their attention in the plain. The front line of the Germans, drawn up at the foot of the hills, was driven back and sought refuge in the wood at the same moment that the bodies kept in reserve behind, assailed by the Roman horse, were dislodged from its shelter, and driven headlong towards the plain. The Cherusci, the bravest and steadiest of the native forces, had occupied the centre of the declivity; but neither their resolute courage, nor the skill and vigour of their leader Arminius, availed to sustain them against the overwhelming pressure of the conflicting tides of fugitives on either side. Thus thrown into confusion, the rout of the Germans was rapid and complete. Arminius and Inguiomerus still maintained the unequal contest with conspicuous gallantry; but, hemmed in between the advancing forces of the Romans, their destruction seemed inevitable, and they owed their lives, as was suspected, to the treachery of some German auxiliaries, who suffered them to burst through their ranks, disfigured and wounded. Broken in front and rear the remnant of their host took flight at every point where they could find an opening: great numbers were slain in attempting to cross the river before, many more fell in the wood behind them, where they climbed the trees for safety, but were transfixed with arrows, or crushed by the felling of the trees themselves: over an area of ten miles in width the ground was thickly strewn with the bodies of the slain; and if the combat itself had been soon decided, the pursuit and slaughter continued without intermission till nightfall. At the close of the day the victors reared a great mound of earth, which they surmounted with the arms of their slaughtered enemies, and the chains found ready in their camp for binding their captives. On the

summit they raised a stone pillar inscribed with the names of the conquered tribes; and, finally, the army saluted the absent Tiberius with the title of Imperator, ascribing the fortune of the day, with redoubled loyalty, to his sacred auspices.[1]

Renewed engagement, and final success of the Romans.

Yet no sooner had they completed these memorials of their triumph than the worsted foe rallied, it seems, for another contest. Doubtless the victory had been far less complete than the flatterers of the empire or the panegyrist of Germanicus had represented it. The barbarians, we are assured, were about to fly beyond the Elbe, and relinquish their territories for ever, when the report of the erection of this insulting monument roused them from their panic and despair. Once more flinging all timid counsels to the winds, they seized a spot surrounded by woods and morasses, and defended by an old native earthwork, and there collecting in a mass formidable alike from its numbers and resolution, defied the advance of the conqueror. Here invasion reached its limits. Germanicus indeed led his legions steadily to the foot of the well-manned lines. He made skilful dispositions for attacking them. He forced the barrier, entered the narrow area within which the Germans were thronged densely together, with a swamp behind, and incapable of retreat. The struggle was furious and bloody. Everything was against the Germans; the closeness of the combat, in which their long swords and even their unwieldy frames were a disadvantage; the recollection of their late defeat; and the consciousness that their last stronghold was stormed before their faces. Even Arminius had lost his gallant spirit; broken by repeated defeats or the wounds he had sustained, he was less decided in his orders, and less conspicuous in the medley. Never, on the other

[1] Tac. *Ann.* ii. 16—18.

hand, did Germanicus more strenuously exert himself. He strove to carry with his own hand the victory his dispositions had brought within his grasp. Throwing his helmet from his head, that no Roman might fail to recognise him, he adjured his soldiers, in the midst of their ranks, to redouble blow on blow, and give no quarter: this, he cried, was no day for making captives, but for utterly destroying the German nation. Multitudes of the barbarians were slain, while the invaders acknowledged but a trifling loss. Nevertheless the legions, we are told, were recalled from the scene of slaughter to their camp for the night, while we hear nothing of the rout or retreat of the enemy. It is admitted that the engagement of the cavalry in another quarter was indecisive. No song of triumph arose on the dispersion of the great German confederacy, at the abandonment of their country, or their flight behind the Elbe; there is no word of their suing for peace or pardon. If Germanicus erected yet another trophy, and emblazoned it with a flaunting inscription, proclaiming that he had subdued all the nations between the Rhine and Elbe, the narrator of his exploits himself confesses that the boast was vain and presumptuous. Of all the native tribes the Angrivarii alone offered to capitulate; but their humble submission appeased, it is said, the vengeance of the conqueror, and he consented to accept it as a national acknowledgment of defeat.[1]

Return of Germanicus again unprosperous.

Nor was it from any anxiety about his own return that Germanicus acquiesced so easily in this pretended pacification. The second month of summer saw his legions withdraw from their advanced posts in the Cheruscian territory, and retire, some by land, but a large force on board the numerous flotilla which had wafted them

[1] Tac. *Ann.* ii. 19—22.

to the mouth of the Ems.[1] The vessels were assailed by severe gales, and once more suffered terribly from the violence of the winds and waves, though the fears of the timid mariners may have magnified the loss and danger. These disasters, however, sufficed to raise the Germans again in arms, so little had they been dispirited by the dubious success of the recent invasion. Germanicus, always prompt and active, however questionable we may think his skill in conducting, or forethought in planning, his expeditions, collected his troops without delay, and by a rapid incursion into the lands of the Marsi and Chatti, checked at least the contagion of their revolt. The recovery of the last of the Varian eagles shed a final gleam of glory over the enterprises of Rome in this quarter. Once more the legions were led back to their winter stations. The young Cæsar was assured that the enemy had never felt such consternation and despair, as when they found him prepared to take the field at the moment when his fleet was lying broken on their shores. Never were they so much disposed to entertain counsels of submission, as during the winter that followed. One more campaign, he was convinced, would complete the conquest of the North. But while meditating on his future triumphs, he was admonished by many letters from Tiberius, that it was time to abandon projects which had reaped in fact nothing but recurring disappointments. It was time, the emperor suggested, to change the policy which had hitherto reigned in the Roman quarters, and relinquishing the employment of military force, which had been attended with grave losses both by sea and land, trust to the surer and safer method of engaging the enemy in domestic dissensions. Closely as the German confederates had been bound together.

Recovery of the last of the Varian eagles.

[1] Tac. *Ann.* ii. 23.: "Adulta jam æstate:" thus explained by Servius on Virg. *Ecl.* x. 74.; *Georg.* i. 43.

under the pressure of foreign aggression, seeds of disunion were still rife among them, and the policy of intrigue, ever patient and watchful, could hardly fail in the end to undermine the nationality of the barbarians. If further laurels, he added, were yet to be gained by arms, it was fair to leave the harvest to be gleaned by the stripling Drusus, for whose maiden sword no other foe but the Germans was left.[1]

The reasoning of Tiberius was specious, and the course he suggested required only vigilance and perseverance to be fully successful. But in laying down a line of traditional policy, which might demand the care of many years, and of more than one or two generations to effect it, he could pledge neither himself nor his successors to persist in it. In fact, the central government ceased from this time to take any warm interest in the subjugation of the Germans; and the dissensions of their states and princes, which peace was not slow in developing, attracted no Roman emissaries to the barbarian camps, and rarely led the legions beyond the frontier, which was now allowed to recede finally to the Rhine.[2] The conquests indeed of Germanicus had been wholly visionary: the language of Tacitus

The frontiers of the empire finally bounded by the Rhine.

[1] Tac. *Ann.* ii. 26. Suetonius (*Tib.* 52.) adds that Tiberius was generally reputed to have disparaged the *glorious successes* of Germanicus as prejudicial to the public interests. It is vexatious, however, to observe how little reliance we can place on the panegyric of Tacitus. His story of the last campaign bears strong features of romance. The interview of the German brothers is an heroic episode. It is not usual with ordinary mortals to converse across a stream a hundred yards in width. The night watch of Germanicus, though not in itself improbable, is suspiciously in unison with the epic colour of the general narrative: and the splendid victories ascribed to him are evidently belied by the results. The account of the shipwreck of the flotilla is a clang of turgid extravagances, amplified perhaps from the statement which Pliny may have founded, with little discrimination, upon the fears and fancies of the survivors.

[2] We shall trace at a later period some further advances of the empire between the upper Rhine and Danube.

is equally extravagant both in vaunting his triumphs, and in blazoning his disasters; and the almost total silence of Dion, a far more sober authority, on the exploits of the popular hero, stamps his campaigns with merited insignificance. Nevertheless there seems no reason to doubt that the discipline of the legions, and the conduct of their officers, even without the genius of a Sulla or a Cæsar at their head, must gradually have broken the resistance of the northern freemen, and that little more of toil and patience was wanting to make the Elbe the permanent frontier of their conquests. This accession of territory would have materially abridged the long line of the national defences, and the garrisons of the Elbe and Danube might have afforded each other mutual support in the peril of a barbarian invasion. It is not impossible that the result of one or two more campaigns at this critical moment might have delayed for a hundred years the eventual overthrow of the Roman Empire. It would be too much to say that the failure of such a result is to be regretted; nor can we venture to lament, for the sake of the Germans themselves, that they were not at this period reduced to subjection to a power of higher and finer organization than their own. But while the gallantry with which the Germans defended their savage homes must always excite our admiration, while we applaud their courage and self-devotion, and thrill at the echoes of their shouts of defiance and songs of triumph, it will be well to guard against an unreflecting sympathy with that misnamed liberty for which they so bravely contended. The liberty of the Germans was at best only the licence of a few chiefs and warriors, backed by a dark and a bloody superstition, in which the mass of the people, the bravest and least corrupted part of the nation had no genuine share.[1]

[1] Tacitus, in his curious but fanciful picture of Teutonic life and manners, would make it appear that the whole body of freemen were

Notwithstanding the false colours he has aimed at throwing over it, the picture of Teutonic freedom which Tacitus gives us is gloomy and revolting, with its solitary caves or wigwams in the forest, its sexes undistinguished in dress, its women, cared for indeed, but not for their charms or virtues, but as beasts of burden and implements of labour. That it was powerless to effect any progress, or to rise of itself to a higher sphere of civilization, appears from the continued barbarism of the four succeeding centuries, during which it roamed its forests unassailed by Rome, and constrained by no foreign pressure. The instincts of Order and Devotion, which distinguished the northern conquerors of Europe, lay undeveloped in the germ, till, in the course of Providence, they met the forms of Law and of Religion which they were destined so happily to impregnate. As with their own lusty youths, to whom the commerce of the sexes was forbidden till they had reached the fulness of manly vigour, the long celibate of German intelligence may seem designed by a superior Wisdom to crown it with inexhaustible fertility.[1]

Germanicus is recalled to Rome.

The offer of the consulship, which the emperor now tendered to his nephew, was equivalent to a command to abandon the camp; and Germanicus was compelled, with sore reluctance, to relinquish his visions of immortal glory for the empty pageant of municipal honours. It was natural that he should see, in this sudden

equal and independent; but this is contrary to all experience, and is opposed to the usage of client or retainership, which seems to have been common in Germany as well as in Gaul. The slaves of the Germans, as our author himself remarks (*German.* 25.), were not domestic, like the Roman, but attached to the soil; they were in fact not slaves, but serfs; and as such we may be assured that they bore arms in their lords' following. The German polity was probably no other than clanship, under which a system of the grossest tyranny is upheld by a perverted sentiment of honour.

[1] Tac. *German.* 20.: "Sera juvenum Venus, eoque inexhausta pubertas."

abridgment of his triumphs, not the prudence but the jealousy of his chief; and such unquestionably was the general view of the army, delighted with his liberality and condescension, and of the people, not unwilling to form the most unfavourable judgment on the acts of a ruler so destitute of the genial graces which captivate an unreflecting populace. Yet it cannot in fairness be imputed as a crime to the emperor, if he desired to break the connexion between his kinsman and the distant legions of the Rhine, which had already expressed their readiness to carry him to Rome and place him on the throne of the Cæsars. Germanicus, with the generosity and perhaps carelessness which belonged to his character, had given some ground of umbrage by offering largesses to the soldiers from his own resources, such as, under a monarchical regime, can only proceed safely from the monarch himself; and Tiberius merely followed the policy of his predecessor in allowing no more than two or three successive campaigns to the same leader, beneath the same eagles, and in the same quarter of the empire.

Triumph of Germanicus.

With the close of the year 769, Germanicus quitted the scene of his high-spirited efforts, being summoned to celebrate the triumph which was offered him in lieu of victory.[1] Of this flattering distinction, indeed, the emperor took to himself the lion's share. The triumphal arch, which was erected on the slope of the Capitoline, was designated by the name, not of Germanicus, but of Tiberius.[2] The recovery of the eagles of Varus, and

[1] Tac. *Ann.* ii. 41.: "Bellumque, quia conficere prohibitus erat, pro confecto habebatur."

[2] Tac. *l. c.*: "Eine anni arcus propter ædem Saturni ob recepta signa cum Varo amissa, ductu Germanici, auspiciis Tiberii . . . . dicatur." This arch of Tiberius, as it is called, but I know not on what precise authority, stood on the slope of the Clivus Capitolinus. Dezobry supposes that it was small and plain, from its having apparently been erected and dedicated in the course of one year Another

the overthrow of the Germans, were together blazoned on the medals which commemorated the solemnity.[1] As the victor approached the city, the populace, full of enthusiasm, poured forth from the gates to the twentieth milestone to meet him, and the ardour of the prætorians, the body-guards of the emperor himself, was not less conspicuous than if they had served under his colours or partaken of his benefactions.[2] The triumph was celebrated on the 26th of May; the Cherusci, the Chatti, the Angrivarii, and the nations generally between the Rhine and Elbe, were specified as the vanquished enemy.[3] Captives were forthcoming, of noble birth and distinction among their people, to adorn the ceremony; and it was without remorse, without even compassion, that the Romans beheld Thusnelda, the betrayed wife of Arminius, led before them, with the infant child whom she had borne in servitude and sorrow.[4] The spoils of war were also exhibited, and the mountains and rivers of Germany, together with the battles themselves, were represented in pictures or emblematically designated. But the citizens gazed at none of these shows so intently as at the figure of the young imperator himself, conspicuous for the manly graces of his person, and surrounded in his chariot by the five male descendants of his fruitful union with Agrippina. Surely there was no room, behind so well-plenished an equipage, for the slave who attended the happiest of heroes in the crisis of

arch of Tiberius was erected by the emperor Claudius near the theatre of Pompeius. Suet. *Claud.* 11.

[1] See Eckhel, *Doctr. Numm.* vi. 209.: "Signis receptis devictis Germanis." Tiberius took the title of Germanicus (Dion, lvii. 8.), but declined that of Pater Patriæ. Tac. *Ann.* i. 72.

[2] Suet. *Calig.* 4.

[3] Tac. *Ann.* ii. 41.: "C. Cæcilio, L. Pomponio, coss., Germanicus Cæsar, A.D. vii. Kal. Junias, triumphavit de Cheruscis, Chattisque, et Angrivariis."

[4] Strabo, vii. p. 291.: who gives the child the name of Thumelicus.

his felicity, and whispered in his ear that he was only mortal! Yet the spectators at least required no such grisly memento. In the midst of their brilliant jubilee they were smitten with a painful misgiving: they remembered how their affection for the father, Drusus, had been blighted by sudden disappointment; how Marcellus, the uncle, had been snatched away in the glow of his youthful popularity: *brief and ill-starred,* they murmured to themselves, *were the loves of the Roman people.*[1]

[1] Tac. *Ann.* ii. 41.: "Breves et infaustos populi Romani amores." The list of early bereavements of the same class might be enlarged with the names of Caius and Lucius Cæsar, and even of Agrippa Postumus: but I do not venture to step beyond the lines traced by Tacitus, and attach to any of these the same painful reminiscences he has specified in the case of the others.

CHAPTER XLIII.

Mission of Germanicus to the East, and of Drusus to Illyricum.—Retirement of Maroboduus, and death of Arminius.—Germanicus journeys through Greece and Asia Minor.—Intrigues of Piso and Plancina against him.—He settles the affairs of Armenia, and visits Egypt.—His sickness and death imputed to Piso.—Grief of the citizens.—Piso attempts to seize the government of Syria.—Is baffled and sent to Rome.—The friends of Germanicus accuse him before the senate.—His defence, suicide, and condemnation.—Tiberius free from suspicion of the murder of Germanicus.—Imposture of Clemens.—Intrigues of Libo Drusus.—Deterioration in the conduct of Tiberius. Influence of Livia over him, and of Sejanus. (A. D. 17—20, A. U. 770—773.)

THE cloud which lowered on the countenance of the Roman people was dispelled by an act of opportune liberality. Tiberius now stepped forward in the name of his adopted son to bestow on the citizens a largess of three hundred sesterces a-piece, and they hailed with acclamations the announcement that the senate, at his desire, had chosen their favourite for the consulship of the ensuing year. It was considered as a special mark of honour that the emperor deigned to accept the same office in conjunction with him. But ere the period for his assuming it had arrived, a new duty had been found for him to discharge. The affairs of the East required to be set in order. The decease of Archelaus, the king of Cappadocia, who had lately died at Rome of distress and apprehension, under a charge preferred against him in the senate, had offered an opportunity for annexing that country to the empire, and its ample revenues had enabled Tiberius to reduce by one-half the tax of a hundredth on sales.[1] The organiza-

Mission of Germanicus to the East.

[1] Tac. *Ann.* ii. 42.: "Fructibus ejus levari posse centesimæ vectigal professus, ducentesimam in posterum statuit." But Cappadocia

tion of this new acquisition remained to be completed. At the same time the people of Commagene, and the still autonomous districts of Cilicia, were said to desire, on the recent death of their native princes, to be subjected to the direct dominion of the Romans, while the provincials of Judea and Syria, on their part, were exclaiming against the weight of the imperial burdens, and entreating to be partially relieved from them.[1] Nor was the peace which had reigned between Rome and Parthia since the interview of their chiefs on the Euphrates secure and satisfactory. After more than one court-revolution, Vonones, a son of the great Phraates, whom Augustus had retained as a hostage, perhaps at his father's desire, and had bred in Roman manners, had been called to the throne by the voice of his countrymen, and placed there with the consent of the imperial government. But his subjects soon manifested disgust at the foreign habits of their new ruler, and ventured to discard him. He took refuge, it appears, not among his old friends the Romans, but in the kindred land of Armenia, which not only offered him an asylum, but, in the actual vacancy of its own throne, accepted him precipitately as its sovereign. Hereupon Artabanus, chief of the neighbouring kingdom of Media, but himself of the royal race of the Arsacidæ, whom the Parthians had invited to rule over them, required the Armenians to surrender the fugitive; but Silanus, the proconsul of Syria, was instructed to anticipate this result, and had succeeded in getting possession of his person by artifice, to be kept in custody within the Roman frontiers, and employed on some future occasion. The Parthians were indignant at the loss of their victim, the Armenians mortified at the in-

was proverbially a poor country: "Mancipiis locuples eget æris Cappadocum rex:" perhaps some treasures were found accumulated in the royal strongholds.

[1] Tac. *l. c.*: "Provinciæ Syria atque Judæa, fessæ oneribus, diminutionem tributi orabant." For the annexation of Judea on the banishment of Archelaus, see vol. iv. chap. xxxvii.

sult to the object of their choice; but Silanus was directed to amuse and negotiate with both powers, and avoid an open rupture by all the arts of diplomacy.[1] Tiberius might hope that the mission of a chief of higher name and authority, attended by an imposing force, and surrounded with the pomp of imperial dignity, would awe, as on former occasions, the murmurs of his rivals into silence. Resolved not himself to abandon the helm of government, and deeming his own son Drusus too inexperienced for the arduous office, he made choice of Germanicus to represent the majesty of the empire in the East. For this purpose he placed him in the same position as Agrippa had held under Augustus, and required the senate to confirm by a decree his appointment to an extraordinary command over the provinces beyond the Hellespont, with full powers for making war or peace, for annexing provinces, enfranchising cities, and modifying their burdens. Tiberius would allow no delay. The young Cæsar was directed to cross the sea the same autumn, and the consulship, which he had been summoned from Germany to hold, he was permitted to retain in Asia.[2]

In the course of the same year Drusus was sent into Illyricum, with directions to watch the movements of the Germans on their southern frontier.[3] Of the two princes Drusus was supposed to be the emperor's favourite, and such, as his own child in blood and the child of his cherished Vipsania, he might naturally be. But the citizens cast themselves on the opposite side, and showered all their affection on Germanicus, whose character was made to shine in popular narratives in contrast with that of his less fortunate cousin. A reason for this preference they dis-

Drusus at the same time sent to Illyricum.

[1] For the affairs of Parthia and Armenia in detail, see Tac. *Ann.* ii. 1—4.

[2] Tac. *Ann.* ii. 43.

[3] Tac. *Ann.* ii 44.

covered in the fact of his higher maternal descent; for Germanicus was the son of an Antonia; while the mother of Drusus was a Vipsania only, and his grandsire, Pomponius Atticus, the friend of Cicero, was a simple knight.[1] But the cousins, or brothers as they were legally styled, were unconscious of these jealousies, or at least unaffected by them. Whatever dissimilarity there might be in their tempers, they lived in perfect amity. Tiberius was anxious that Drusus should emulate the elder prince in the career of public toils and honours. He was glad to remove him from the dissipations of the capital; he was desirous also of completing his military training; it was surmised by some that he felt more secure in his own elevation above the laws when each of his children stood at the head of one of the chief armies of the republic. But the state of affairs on the Danubian frontier undoubtedly required the presence of a commander on whose loyalty and zeal the emperor could fully rely, and the mission both of Germanicus and Drusus seems to have been dictated by a legitimate policy.

War between the Marcomanni and the Cherusci. A. D. 17—19. A. U. 770—772.

The withdrawal of the Roman forces from the soil of Germany had restored peace to its northern districts; but no sooner were Arminius and his Cheruscans relieved from their annual aggressions, than they turned their arms on their own brethren, the Suevi in the south. The kingdom of Maroboduus, which he professed to rule after the fashion he had learnt in the city of the universal conquerors, gave umbrage to the national spirit of the yet untamed barbarians. Even among his own subjects there were many who viewed his innovations with disgust. On the first onset of the Cherusci, the Semnones and Langobardi, who were numbered among the Suevic tribes went over to

[1] Tac. *Ann.* ii. 43.

them; and this defection was but partially balanced by the caprice of Inguiomerus, the bravest of the northern patriots, who, with a band of clients and retainers, attached himself to the service of Maroboduus. Nor indeed had the Cherusci been so long confronted with the Roman legions without acquiring some knowledge of their tactics. When the two native armies met in the field they were found to be armed and marshalled alike, after the fashion of the masters of the art of war. Each of the rivals could vaunt that they had learnt to baffle the terrible Romans with their own weapons: the Cherusci could point to the spoils they had wrested from Varus; the Marcomanni boasted that they had kept Tiberius himself at bay and sent him back unlaurelled across the Danube. The battle which now ensued between them resulted in the defeat of Maroboduus; and upon this, many of the tribes he had enlisted under his standards passed over to the other side: when he could no longer make head against the triumphant Arminius, he prostrated himself before the emperor and implored his succour. Tiberius replied that he had no right to look for assistance from the power from which he had himself withheld aid in its contest with the Cherusci: nevertheless the Romans were magnanimous as well as powerful, and would not refuse to interfere to save their new client from destruction. It was under these circumstances that Drusus was despatched to the Danube, with directions ostensibly to negotiate terms for Maroboduus: but he received, it would seem, more private instructions, to raise fresh enemies against him, and secretly effect his ruin from another quarter.[1] Shielded from the violence of Arminius, the king of the Marcomanni was overthrown by the intrigues of Catualda, a chief of the Gothones, who had suffered some injury at his hands. Driven

[1] Tac. *Ann.* ii. 44—46.

across the Danube, he addressed a letter to Tiberius, in which he solicited an asylum in the Roman territories, and his request was coldly granted. Retained in honourable confinement at Ravenna, he was constantly amused with the hope of being restored to power by the Roman armies: but the expected moment never came, and after lingering in suspense and disappointment through a period of eighteen years, he died at last an object of scarcely merited contempt to the few who yet remembered that he had been a king and the founder of a kingdom.[1]

Maroboduus seeks shelter within the Roman dominions.

The success of the artifices of Tiberius against German liberty was further exemplified in the offer he is said to have received at this period from a chief of the Chatti, to effect the removal of Arminius privily. The barbarian demanded to be furnished with some subtle poison, such as the Romans were but too skilful in preparing. This nefarious proposal was recited to the senators by the emperor's command, that they might hear his generous reply to it. Their fathers, he reminded them, had forbidden the employment of poison against Pyrrhus, for the Romans were wont to avenge themselves on their enemies, not by secret machinations, but openly and with arms.[2] But the empire, in fact, had no more now to fear, from the influence of its ancient antagonist; for Arminius, the bulwark of German independence, degenerated in the hour of his triumph from the virtues of a patriot chief, and himself affected the tyranny over his countrymen which he had baffled in Germanicus, and rebuked in Maroboduus. His people retorted upon him the lessons of freedom with which he had

Death of Arminius. A. D. 21. A. U. 774.

[1] Tac. *Ann.* ii. 63.

[2] Tac. *Ann.* ii. 88. See, for the generosity of Fabricius, Plutarch *in Pyrrh.* 12.; Cic. *de Off.* iii. 22.; Val. Max. vi. 5. 1., and other writers.

inspired them, and after a struggle of some length and many vicissitudes, he was slain by domestic treachery. The liberator of Germany had achieved victory over the Romans, not in their youth and weakness, like Pontius or Porsena, but at the period of their highest power and most varied resources. His life was extended through thirty-seven years only, during twelve of which he had enjoyed the chief place among his countrymen: his name, though its reputation was clouded at its close, continued long to be chanted in their households as the watchword of liberty and glory: but to the Greeks, whose view was limited to the world of Hellas, the fame of the German hero remained unknown; and even the Romans disregarded it in comparison with more ancient celebrities, till Tacitus rescued it from obscurity, and poured on it the full flood of his immortal eloquence.[1]

Career of Tacfarinas in Africa.

The operations which occurred at the same period on the southern frontier of the empire were of little political importance. While the African provinces were numbered among the most opulent of the Roman possessions, they were, from the character of the country, generally exempt from the barbarian warfare, by which so many other districts were harassed or alarmed. The skirts of the long chain of the Atlas, indeed, always harboured tribes of unsubdued and predatory barbarians; but the strength of the African hordes was so feeble, their means and resources so limited, that their warfare was rather that of banditti than of hostile nations. Only when marshalled by a chief of Roman origin or training could they become formidable either from

[1] Tac. *Ann. l. c.* If the twelve years of his authority are counted from the defeat of Varus (762), his death would take place in 774. Tacitus does not mark the date very distinctly. Dion only once mentions the name of Arminius, in connexion with Varus, and never alludes to him again.

their skill in fight or their powers of combination. Thus in the wars of the first Cæsar, a knight named Sittius had placed himself at the head of a disciplined force, with which he had seemed for a moment to hold the balance between the contending factions of Rome itself. We now read of the exploits of a native warrior named Tacfarinas, who turned the science he had acquired in the Roman camp, as a captain of Numidian auxiliaries, into an instrument of arrogance and insult to the majesty of the empire.[1] Having deserted the service of the proconsul, he had gathered round him the bands of roving robbers who infested the mountains, and had divided them into troops and companies. Accepted as their chief by a tribe called the Musulani, he had associated with them the Moorish warriors on their borders, who owned the sway of a leader named Mazippa: while the one body, armed and trained after the manner of the legions, formed the main strength of these confederate forces, the other, following the fashion of the country, skirmished actively on its flanks, and carried fire and sword within sight of the Roman cantonments. Disaffection was spreading among the subject nations of the province itself, when the proconsul Furius Camillus advanced with the forces under his command to repress it by a decisive blow. The defence of the peaceful province had been entrusted to a single legion with its auxiliary cohorts, and this little army well handled was sufficient to overcome all resistance in the field. Tacfarinas, confident in the tactics he had learnt from his late masters, ventured to give battle, and suffered a speedy defeat. The proconsul claimed the honours of a conqueror; and Tiberius, it was surmised, was the more willing to grant them on account of the obscurity of his name, which, high as it once stood

[1] Tac. *Ann.* ii. 52.

in the fasti of the republic, had been illustrated by no distinctions since the almost forgotten days of the Gaulish invasion.[1] Camillus himself had had no previous experience in arms; nor was he now elated with success, or tempted, as the chastiser of a horde of savages, to believe himself a mighty general. He was not indeed aware of the fact, soon proved by the event, that his success was illusory and indecisive.

Germanicus, after passing but a few months in Rome, had departed by Ancona and the Dalmatian coast, where he had had an interview with Drusus, to assume his ample powers in the East. By the first day of the new year, the commencement of his consulship, he had arrived at Nicopolis, the city founded by Augustus on the shores of the Ambracian Gulf. The descendant in blood of Antonius, and in law of Octavius, might behold with mingled feelings the scene of a battle so fortunate, and at the same time so fatal, to his race.[2] From thence he shaped his course through Athens, where he recommended himself to the citizens by his studied moderation, in dismissing all his lictors but one; and received in return the highest compliments the Athenians could confer, which consisted, it would seem, in a studied panegyric on their own greatness.[3] From Athens he crossed to Eubœa, and thence to Lesbos, in the usual track of the Roman proconsuls. From Lesbos, however, he took a wider sweep, visiting the Propontis and the cities on both its shores, and entering the Euxine Sea, partly to gratify his interest in scenes

Tiberius III., Germanicus II., consuls. A. D. 18. A. U. 771.

[1] Tac. *l. c.*: "Nam post reciperatorem Urbis, filiumque ejus Camillum, penes alias familias imperatoria laus fuerat."

[2] Tac. *Ann.* ii. 53: "Sacratas ab Augusto manubias (the beaks suspended in the temple of Apollo) castraque Antonii, cum recordatione majorum suorum adiit."

[3] Tac. *l. c.*: "Excepere Græci quæsitissimis honoribus, vetera suorum facta dictaque præferentes, quo plus dignationis adulatio haberet."

of historic celebrity, partly to console and encourage by his presence the places which had suffered most severely from the vicissitudes of war and the oppression of unjust rulers.[1] Only the year before no less than twelve cities of the interior had been overthrown or damaged by a destructive earthquake: but steps had been already taken through a special commission of inquiry, and by the prompt remission of several years' tribute, to repair the effects of this extraordinary visitation.[2] Germanicus does not seem to have made it part of his business to visit the sufferers. His travels were prompted perhaps chiefly by curiosity of a character more or less enlightened. Thus, for instance, he steered for the coast of Samothracia, in order to be admitted to the mysterious rites of the Cabiric priesthood, but could not reach it from adverse winds. He landed, however, on the shore of Ilium, again skirted the coast of Asia, and consulted the oracle of Apollo at Claros, where the priest who revealed the answer of the divinity is said to have given him an intimation of the early death which awaited him.

Piso Cnæus Calpurnius appointed proconsul of Syria.

The interests which Germanicus thus appears to have indulged were scarcely worthy, perhaps, of the prince to whom public affairs of so much importance were entrusted, at a moment when every step he took was watched, as he must have known, with jealous scrutiny, not only by the emperor, but by at least one powerful rival among the nobles.[3] It is possible, indeed, that the

[1] Tac. *Ann.* ii. 54.

[2] Tac. *Ann.* ii. 47.: "Eodem anno (770) duodecim celebres Asiæ urbes conlapsæ nocturno motu terræ . . . . mittique ex Senatu placuit qui præsentia spectaret refoveretque." A prætorian senator was sent to obviate any jealousy on the part of the consular governor of the province. It is just possible that this might be the reason why Germanicus omitted to visit the injured cities.

[3] Tacitus notices the antiquarian spirit of the Greeks rather contemptuously. *Hist.* ii. 4.: "Spectata opulentia donisque regum, quæ-

innocent character of a traveller and a sightseer was purposely adopted to disarm suspicion: but in fact a wiser man than the young Cæsar would have felt that he was more concerned to guard by vigorous and decisive movements against the intrigues of a fellow-subject than the distrust of their ruler. On appointing Germanicus to the command in the Eastern provinces, Tiberius had taken the precaution, so his conduct was interpreted, of removing from the government of Syria the prince's friend and adherent Silanus, and placing there a man whose pride and personal pretensions might be used as an instrument for controlling his ambition.[1] Cnæus Piso, on whom this appointment was conferred, was a member of the Calpurnian gens, which claimed as high an antiquity as any of the oldest families of Rome, and at least in the last century of the republic, had repeatedly filled the highest magistracies. The surname of Piso was common to more than one branch of this noble house, and the prænomen Cnæus had descended to the personage now before us from a father who had fought through the wars of Cæsar and Pompeius, had shared the disasters of Cassius and Brutus, and though pardoned by Octavius, had

Pride of the Calpurnian gens, and antagonism to the Cæsarean family.

que alia lætum antiquitatibus Græcorum genus *incertæ* vetustati affigit." But the Roman nobles showed their Hellenic culture by affecting a similar taste; thus Cæsar, the Cæsar at least of Lucan, spent a day in visiting the plain of Troy, under the guidance of a native cicerone: "Herceas, *monstrator* ait, non respicis aras?" *Phars.* ix. 979. Comp. viii. 851.: "Nam quis ad exustam Cancro torrente Syenen Ibit, et imbrifera siccas sub Pleiade Thebas, Spectator Nili?" and the whole spirit of the description of the Nile in the tenth book. See also the address to Celer in Statius, *Sylv.* ii. 2. 197.:

"Te præside noscat
Unde paludosi fœcunda licentia Nili . . . .
Duc et ad Ænathios Manes ubi belliger urbis
Conditor Hyblæo perfusus nectare durat . . . ."

[1] Tac. *Ann.* ii. 43. The daughter of Silanus was betrothed to Nero, the eldest son of Germanicus, then a mere child. The marriage seems never to have taken place.

disdained to solicit employment under the new institutions.[1] Only when spontaneously offered him by the emperor had he deigned to accept the consulship. Cnæus Piso, the son, was reputed a proud man among the proudest of circles, the magnates of the expiring free state and the rising empire; a class whose intense self-assertion was inflamed by family names, family rites, family images and ensigns. The decline of their numbers after the slaughter of the Sullan wars had imparted still greater concentration to this feeling; and claiming complete equality among themselves, they hesitated to acknowledge a superior even in the emperor himself. To an Æmilius or a Calpurnius, a Lepidus or a Piso, the son of an Octavius was still no more than a plebeian imperator, raised to power by a turbulent commonalty: a breath, they felt, had made him, and a breath, they fondly believed, might yet overthrow him. Whether as an emperor or a private senator, whatever might be his actual powers, his pretensions to legitimate right they haughtily despised and repudiated. They had marked, no doubt with peculiar jealousy, the alliance of the plebeian Octavius with one of their own houses, the Claudian, the nobility of which it was impossible to gainsay: but this served only to convert their disdain into jealousy, and impel them to a state of antagonism or rivalry, from which they had before held contemptuously aloof. When once invited to compare themselves with their ruler, it was easy to persuade them that each had individually a claim to empire, to the full as good as the man whom fortune had placed in the ascendant. Piso deemed himself the natural equal of Tiberius, or if he had

[1] Tac *Ann. l. c.*; comp. Smith's *Dict. of Class. Biography*, art. Piso, Nos. 22, 23. There were also two Cnæus Pisos before the last-mentioned, one quæstor to Pompeius in the Piratic War, the other the associate of Catilina, murdered in Spain. It is not clear from which of these the Pisos in the text descended.

any misgivings of his own, his consort Plancina, the daughter of Munatius Plancus, the chief who for a moment had trimmed the scales between the armed factions of the republic, was of a temper to dispel or overrule them. This imperious woman had formed, moreover, an intimacy with the empress-mother, in whose plans for prolonging the tutelage of Tiberius she had probably borne a part. She had learnt to despise the son in the cabinet of the mother. Still more did the vainglorious pair look scornfully on the children of the man for whom they had so little respect himself. Piso believed that he was appointed to the government of Syria in order to check the ambitious designs which it was so easy to impute to Germanicus, and Plancina may have been instructed by Livia to play the rival to Agrippina; for the people, at least, were easily persuaded that the imperial house was already a prey to domestic jealousies. Conscious of their own preference for Germanicus, they were not less convinced of the partiality of Tiberius for Drusus, and they were persuaded that the fertility of Agrippina, the consort of the one, must be a source of mortification and dislike, when contrasted with the barrenness of Livilla, the wife of the other.[1]

Plancina, wife of Piso, a favourite of Livia.

The mission which Piso seems to have considered as covertly confided to him, that of thwarting his superior, and bringing his authority into contempt, he began to discharge with zeal, and even precipitate vehemence, from the moment he

Conduct of Piso in Syria.

[1] Tac. *Ann.* ii. 43. The name Livilla, the diminutive of Livia, was used frequently to distinguish the wife of Drusus from the empress-mother. Livilla was a daughter of the elder Drusus, and sister of Germanicus, married first to Caius Cæsar in very early youth, and, on his decease, to the son of Tiberius, her cousin. She may have had one daughter Julia, afterwards united to Nero Drusus and Rubellius Blandus, in the first ten years of her second marriage: but it was not till 772 that she bore a son, one of twins, named Tiberius Gemellus. See *Ann.* ii. 84.

quitted Italy. Following Germanicus to Athens, he pretended to reflect on his unseemly derogation from the majesty of the ruling people, in paying his tribute of courteous admiration to the monuments of the city of Minerva. The prince, though not uninformed of this insolent behaviour, nevertheless treated his subordinate with marked kindness: on one occasion he even saved his life, by sending him assistance when in danger from a storm at sea, and when his death, if he had been overwhelmed in the waters, might have been fairly ascribed to accident. From Rhodes, where they met for the first time, Piso proceeded direct to the eastern provinces, while his chief still lingered on his route; and on reaching Syria and the quarters of the legions, began without delay a course of conduct which seems to point, not so much to a studied hostility to Germanicus, as to a rash and crude design of seizing supreme power for himself. Not only did he adopt every method of corruption, to make himself a party among the officers and soldiers: he went so far as to dismiss both centurions and tribunes of his own authority, and to remodel the command of the troops to suit his own purposes.[1] The men, debauched already by the general relaxation of discipline, seem to have been easily won over; and even the provincials, unconscious, it would appear,

[1] The exact position of Piso towards Germanicus, which seems to have allowed him considerable, but ill-defined authority, is marked by the term *adjutor* applied to him by Tiberius at a later period, *Ann.* iii. 12. It will be remembered that when the young Caius Cæsar was sent by his grandfather Augustus to compose the affairs of the East, a *rector* was provided him, to advise or even, inexperienced as he was, to direct his public measures. His first *rector* was Quirinius (*Ann.* iii. 48.), who, as A. Zumpt has shown in his *Comment. Epigraph.* ii, was probably proconsul of Syria at the time of his arrival. The appointment of Piso seems to have been meant as an imitation of the policy of Augustus. In the proconsul of Syria Germanicus received not a *rector*, but, as an older man, an *adjutor* only, whose duties were less clearly defined; there is no reason to suppose that Tiberius had any sinister view in giving him this honorary assistant.

of the true duties of a Roman imperator, applauded his indecent indulgence, and entitled him the *Father of the Legions*.[1] In these artifices he was warmly seconded by Plancina, who courted the soldiers by appearing at their reviews and exercises, a practice which the Romans pronounced unfeminine; and the rumour was industriously spread that the conduct of her husband, and her own constant abuse of Germanicus and Agrippina, were not displeasing to the emperor himself.

Germanicus leaves it unnoticed, and devotes himself to affairs.

Strange indeed it must appear, if these proceedings have been truly reported, and if, as we are assured, he was fully acquainted with them, that Germanicus should have postponed their repression to any other object of his mission whatever. Such conduct could have no other result, whatever the feeling which originally prompted it, than military insubordination, and discord in camp and council; and it is difficult to conceive that the vicegerent of the emperor could have any other duty so urgent as that of crushing the first germs of civil commotion. Germanicus, however, was advised otherwise. The settlement of the relations of the empire with Armenia was the direct object of his mission, and to this he calmly devoted his whole attention. In order to give full weight to the terms he was instructed to impose, he marched in person within the Armenian frontiers at the head of his forces. Instead, however, of restoring the fugitive Vonones, still retained in custody in Syria, to the throne from which the jealousy of the Parthians had ejected him, he affected to consult the wishes now expressed by the capricious Armenians themselves, in appointing in his room a son of Polemo, king of Pontus,

He crowns Polemo with the diadem of Armenia.

[1] Tac. *Ann.* ii. 55.: "Ut sermone vulgi Parens Legionum haberetur." It is not clear perhaps whether the writer means by *vulgus* the generality of the provincials, or the rank and file of the army itself.

named Zeno, whose early training in their own customs gave him a nearer claim to their regard. In the royal city of Artaxata, and surrounded by the native nobility, the Roman Cæsar placed the diadem on his destined vassal's head, saluting him in the name of his new subjects with the title of Artaxias, signifying greatness or sovereignty. To the envoys of Artabanus, who professed an ardent wish to cultivate the friendship of Rome, and begged for their chief the honour of an interview on the Euphrates, he replied with the dignity which befitted his position, and the modesty, at the same time, which was peculiar to himself. He assented, moreover, to the request of the Parthians that he would at least remove Vonones further from the frontier, and assigned him a residence at Pompeiopolis, on the Cilician coast. Vonones, it seems, had been making interest with Piso and Plancina, and built on their influence his hopes of returning in triumph to Armenia or even to Parthia. It was surmised that the ease with which Germanicus yielded on this point to the desires of Artabanus was partly owing to the hostile relations subsisting between himself and the Syrian proconsul. Piso had offended him, as an imperator, beyond forgiveness in disobeying his commands respecting the movement of troops, and the meeting between them, which took place at their winter quarters at Cyrrhus, had been marked by coldness on the one side, and defiance hardly disguised on the other. Piso had taken on himself to check the customary adulation of an eastern prince, who had offered Germanicus a crown of gold, of much greater weight than that he tendered to his subordinate, rejecting the present to himself with pretended indignation, and exclaiming that the compliments addressed to his superior befitted the son, not of a Roman prince, but of a Parthian tyrant.[1]

[1] Tac. *Ann.* ii. 56—58.

The formal reduction of Commagene and Cappadocia to the condition of provinces, completed the work of the year. In the following winter Germanicus made a tour in Egypt, with the professed object of examining the state of that province; but his ardour in the study of antiquities was, it would appear, a more urgent motive for his journey.[1] His behaviour to the natives there was as usual studiously moderate and courteous: he not only appeared among them unattended by soldiers, and in the peaceful garb of a Greek philosopher, as Scipio had visited Sicily in the heat of the Punic war, but opened the granaries for the cheaper and more abundant supply of grain. Tiberius is said to have addressed him with a gentle reproof for a condescension which was deemed unworthy of his station; but the affairs of Egypt lay beyond the sphere of his mission, and he was rebuked more pointedly for disregarding the rule established by Augustus, that no senator nor even a knight should enter Egypt at all, except with the emperor's special permission. While, however, these unfavourable remarks were yet unknown to Germanicus, he continued his progress, ascending the Nile from Canopus, visiting the Pyramids and temples on its banks, and listening with awe and wonder to the mysterious music which *breathed from the face* of Memnon.[2] He consulted, moreover, the oracle of the bull Apis, and received, it was said, an ominous response.[3] Nor did he retrace his steps till he had reached Elephantine and Syene, the furthest limits of the empire.[4] The real objects of his mis-

Germanicus visits Egypt. A.D. 19. A.U. 772.

[1] The motive which Suetonius alleges, to take measures for the relief of an impending scarcity, is not mentioned by Tacitus, and seems at least superfluous. Suet. *Tib.* 52.; Tac. *Ann.* ii. 59.

[2] Tac. *Ann.* ii. 60.

[3] Plin. *Hist. Nat.* viii. 71.

[4] Tac. ii. 61.: "Elephantinen ac Syenen, claustra olim Romani imperii; quod nunc (in the time of Trajan) rubrum ad mare pa-

sion to the East had been already accomplished, and he might amuse his leisure with contemplating the wonders of the land of mystery and fable; but the notice which now reached him of the emperor's displeasure, hastened perhaps his departure from it. The senate indeed, while it listened with silent deference to the murmurs of Tiberius, concurred in voting an ovation to his nephew for his settlement of the affairs of Armenia, and an ovation also to his son for the capture of Maroboduus. The two princes were invited to enter the city in solemn procession together.[1] But Germanicus now shaped his course from Egypt to Syria, where he found that his regulations and appointments had been audaciously overruled by Piso. The warmth to which he was at last excited by this insolence seems to have determined the offender to quit the province of his own accord. Piso had already made preparations for relinquishing his post, when the feeble state of health into which the Cæsar now fell induced him to defer his departure. Presently, however, the young prince seemed to revive, and the provincials vied with one another in courtly demonstrations, at which Piso was so mortified as to break out into actual violence against the astonished populace of Antioch. Retiring, however, no further than Seleucia, he there proposed to await the event of his chief's sickness, which had again returned; while the attendants of

Germanicus returns to Syria.

His sickness imputed to poison administered by Piso.

tescit;" meaning perhaps the Indian Ocean. Syene, the modern Assouan, was supposed to lie under the Tropic of Cancer, a fact which the ancients established from the direct rays of the sun being visible there, as they affirmed, at the summer solstice at the bottom of a well. This phenomenon, however, might be observed at any spot within a quarter of a degree of the actual circle. Mannert. x. i. 322.; Malte-brun, *Geogr.* i. 9. Its exact latitude, indeed, is 24° 5′ N., while the tropical circle is 23° 28′, a difference of 37′. It is said, however, that the inclination of the shadows is still not perceptible to the eye there.

[1] Tac. *Ann.* ii. 64.

Germanicus murmured their suspicions that he had administered poison to their patron. They pretended, moreover, that he had assailed his life with magical incantations, in proof of which they produced charms and amulets, with the remains of human bones, hidden under the floor of his apartment, and the name of Germanicus inscribed on leaden tablets buried amongst these implements of witchcraft. The Romans were fully persuaded of the pretended powers of sorcery, and they had ample experience perhaps of the actual effects of poison: yet it hardly occurred to them that the use of the one must be superfluous as an adjunct to the other. We may be allowed to think that in producing this secondary proof of Piso's criminality, they have weakened the credibility of the primary accusation.[1]

Meanwhile the messengers whom Piso sent to inquire after the prince's health were naturally regarded as spies, if not as assassins. Germanicus, it seems, was himself fully impressed with the idea that he was the victim of treachery, and he dictated from his bed a letter to the culprit, in which he formally renounced his insidious pretensions to friendship.[2] At the same time he commanded him to surrender the ensigns of authority, and, as some related, to quit the province, fearing to expose to his implacable hatred, on his own anticipated decease, the lives and fortunes of his defenceless family.[3] Whether commanded or only admonished, Piso sullenly submitted. He put himself on board a vessel, and sailed westward: nevertheless he continued to linger on his route, awaiting the moment of the prince's dissolution to return, and boldly seize again the proconsular power in Syria.

Death of Germanicus. A. D. 19. A. U. 772.

[1] Tac. *Ann.* ii. 69.; Dion, lvii. 18.

[2] Tac. *Ann.* ii. 70.: "Componit epistolas, queis amicitiam ei renuntiabat."

[3] Tac. *l. c.*: "Addunt plerique, jussum provincia decedere."

Germanicus grew rapidly worse. With his failing breath he called his friends into his presence, and adjured them to prosecute Piso and Plancina as the real authors of his death, and charge the senate to avenge his murder with a stern and righteous judgment. Many brave and noble spirits were assembled round his bed, devoted to the republic and the Cæsarean family, and this appeal to their affection was not made in vain. They promised to hold his last wishes sacred; nor did they fail in their promise.[1] Finally the dying man turned to his faithful Agrippina, whose heart was ready to break with grief and rage, and implored her to moderate her transports, to check the fury of her indignation, and for the sake of their children, so dear to both, abstain from any show of pride which might give offence to personages more powerful, as he said, than herself. This covert allusion was supposed to point at Tiberius himself; and the rumour was eagerly embraced by a licentious populace, that their favourite with his last breath had warned his relict to beware the malice of her natural guardian.[2]

Reflections upon his character.

The character of Germanicus, as I have already intimated, is represented as one of the most interesting of Roman history. It is embellished by the warmest and most graceful touches of the greatest master of pathos among Roman writers, and invested with a gleam of mournful splendour by the laments and acclamations of the populace to whom he was endeared. It is the more difficult to form a just estimate of it, from the impossibility of distinguishing, in the pages of Tacitus, the genuine statements of history from the gloss put upon them by a sentimental admirer. On the whole, the impression we may most justly receive is, that Germanicus was a man of warm and generous temper, but too soft, perhaps, and flexible in disposition

[1] Tac. *Ann.* ii. 71. [2] Tac. *Ann.* ii. 72.

ever to have become a patriot or a hero. His condescension to the susceptibilities of the Athenians and Alexandrians was rather puerile than statesmanlike. It is a childish affectation in a ruler to pretend to be an equal. The hard and self-controlling Tiberius was right in reproving it. The emperor, the real man of the world, trained in action and suffering, knew better the painful requirements of the imperial station. Nor, again, was the taste the young prince exhibited for mere curiosities, and the excitement of sight-seeing, quite worthy of his deep responsibilities. His proceedings, indeed, are described by Tacitus in the spirit of a dilettante, and some portion at least of the frivolity which seems to attach to them may be laid perhaps to the charge of the author rather than of the actor himself. Such, nevertheless, under the circumstances of the times, was not the stuff of which the ruler of a hundred millions of men could auspiciously be made. We shall meet, as we proceed, with similar examples of well-disposed youths born in the Roman purple, displaying in early life almost feminine graces of character, but degenerating under the trials and burdens of maturer years into timid and selfish tyrants. But it is futile perhaps and presumptuous to draw conclusions from such slight and shadowy data as we possess: the remains of Germanicus have been embalmed in the fragrance of an immortal history, and it seems a kind of desecration to turn him in his tomb.

Germanicus fondly compared to Alexander the Great.

The decease of the illustrious Cæsar drew tears from the provincials, and even from the people of the neighbouring countries, while allies and tributaries felt that they had lost in him a generous friend and protector. Solemnized at a distance from the home of his race, his funeral was not adorned with the images of his ancestors, which occupied their niches along the walls of the paternal mansion: but the place and circum-

stances of his death, cut off as he was by premature disease far from his native soil, on the spot which his virtues and genius had made his own, throw some colour of excuse over the fond idea of a resemblance between him and the great Alexander.[1] The character of the renowned Macedonian conqueror was indeed the type to which the Romans were constantly turning. Pompeius had emulated it; even Crassus had aspired to it; the flatterers of Octavius had confidently ascribed it to their patron. The claims of Germanicus to such a comparison were slight indeed; the only points of similitude that could be pleaded for him were his youth and generosity, the first an universal, the second a common attribute of early manhood: yet such is the charm of these qualities that they gained him more perhaps of his countrymen's admiration than if he had conquered a Mithridates, or avenged the defeat of Carrhæ. His body was consumed in the forum at Antioch, after being exposed to public view naked. Such as were already preoccupied with the conviction of his assassination are said to have traced on it indubitable marks of poison; while less prejudiced observers, it was admitted, perceived no indications to justify the suspicion. The friends of Germanicus, however, were intent on bringing the supposed culprits to justice. They seized a woman named Martina, a creature of Plancina, and one already obnoxious in popular estimation to the charge of a professed poisoner, and sent her to undergo examination at Rome, while they concocted their formal accusations against both Piso and his wife. The lieutenants of the deceased prince, and as many senators as were present, took on themselves, in the absence of any regular authority, to choose a proconsul for Syria, in anticipation of the legitimate appointment of the em-

Suspicions of poison.

[1] Tac. *Ann.* ii. 73.

peror. It was important for their views against the late proconsul to occupy the place he had so reluctantly vacated, and shut the doors of the province against his unauthorized return. The imperium was devolved, after some discussion among them and the competition of more than one candidate, upon Cnæus Sentius.[1] Agrippina herself made no longer stay in Syria, but embarked with her children, and, bearing the ashes of her husband, directed her course for Rome.[2]

Indecent exultation of Piso.

Piso meanwhile awaited the long-expected assurance of his enemy's removal at the island of Cos. His triumph was insolently avowed. He did not hesitate to offer vows and sacrifices on the occasion; and his wife, it was remarked, chose that moment for putting off the garb of mourning which she had recently adopted for the death of a sister.[3] Nor were there wanting among the adherents of the disgraced proconsul advisers who counselled him to return without delay to Syria, and claim the province as his own. His dismissal, if such it really was, had been irregular; it had been unauthorized either by the emperor or the senate; the substitution of a successor might be represented as violent and indecent. His son Marcus, however, would have dissuaded him from so daring an act, so near akin to treason and rebellion, and recommended rather his continuing on his course to Rome, and seeking at the emperor's hands restitution of the government of which he had been, as was alleged, so arbitrarily deprived.[4] The bolder advice prevailed. The more Tiberius actually rejoiced in the death of the prince he so deeply distrusted, the more, it was argued, would he, for appearance sake, steel himself against the appeal of that prince's acknowledged enemy. At the same time the pride of Piso revolted against the indignity of kneel-

[1] Tac. *Ann.* ii. 74.
[2] Tac. *Ann.* ii. 75.
[3] Tac. *l. c.*
[4] Tac. *Ann.* ii. 76.

ing even to the noblest of the Romans. If terms were to be made, he would make them sword in hand. Without absolutely contemplating an armed insurrection against the imperial authority, he still rashly fancied that his position would be more secure and independent at the head of the Syrian legions, than as a solitary suppliant at the door of the palace. He addressed a letter to the emperor, setting forth his complaints against Germanicus, and representing his claims to the government which had been abruptly taken from him. Then summoning his guards and centurions, he retraced his steps towards Antioch. Landing on the coast, he intercepted some detachments which were marching into Syria, while at the same time he required the petty chiefs of Cilicia to furnish him with their stipendiary forces.[1] The Mediterranean itself was not wide enough to allow the foes of Agrippina to pass her without meeting.[2] An altercation ensued between them, which nearly led to a desperate encounter; but when Vibius Marcus, who conducted the widow homeward, cited the assassin, as he freely styled him, to purge himself at Rome, Piso abstained from a hostile defiance, and replied that he would not fail to appear at the legitimate summons of the prætor. At the outset of his daring enterprise his courage seems to have already failed him. His forces, indeed, were altogether inadequate to the service for which he had designed them, and his only hope

He claims the government of Syria.

Tac. *Ann.* ii. 78. Cilicia Aspera, as has been shown by Zumpt (*Comm. Epigr.* ii.), was annexed to the province of Syria after its separation by Augustus from Cyprus, which was surrendered to the senate. Hence we infer that Quirinius, who gained the triumphal ornaments for his victories over the Homonadenses, a Cilician tribe, was actually governor of Syria. Tac. *Ann.* iii. 48. Accordingly the bold act of Piso in arming the militia of this district was not an invasion of another governor's authority, but only the assertion of what he pretended to be rightfully his own.

[2] Tac. *Ann.* ii. 79.

must have lain in the cowardice or want of faith of the chiefs opposed to him. But Sentius stood his ground firmly. He repelled Domitius, the officer whom Piso had sent before him to secure a footing in Syria; and, when Piso himself took refuge in the fortress of Celenderis in Cilicia, advanced with the forces of the province against it, and sat down resolutely to reduce it. In vain did Piso try all the arts of persuasion and corruption on both the men and their leaders. Baffled and reduced to despair he sued for leave to remain unmolested in the place, on surrendering his arms, till the question of the Syrian government should be decided by the emperor. His conditions were rejected, and no other indulgence was accorded him than leave to quit his place of refuge, and take ship direct for Rome.[1]

Thus defeated in an adventure so questionable in its character, Piso must have felt his position, whether as a suppliant for the prince's favour or a claimant for his justice, far more insecure than it had been before he rashly turned back from Cos. The temper of the citizens was inflamed violently against him. In their breasts, at least, there was no doubt of his guilt; and the freedom with which, in the bitterness of their sorrow, they coupled the names of Tiberius and Livia with those of the detested Piso and Plancina was far more likely to irritate the emperor against him than induce him to throw a shield over his misfortunes. The first news which arrived at Rome of the failing health of Germanicus had excited popular suspicion against his uncle: it was muttered that his reputed patriotism, and the desire ascribed to him to restore the republic, were the cause of the fatal hostility of the head of his house. On a premature announcement of his death the whole city spontaneously assumed all

Sympathy of the Romans for Germanicus.

[1] Tac. *Ann.* ii. 79—81.

the outward marks of an appointed mourning; and when again fresh arrivals from Syria proclaimed that he was still living, the people passed to the opposite extreme of frantic exultation, till the doors of the temples were burst with the pressure of the crowd of grateful worshippers.[1] But the fatal assurance of his actual decease was not long delayed. The usual honours paid to the dead Cæsars were decreed him with more than usual genuineness of feeling. Triumphal arches were erected to him, not in Rome only, but on the Rhine and among the heights of the Amanus; and it was recorded upon them that he had *died for the republic*.[2] His statues were set up in various cities, and sacrifices made before them; finally his bust was placed in the libraries and public galleries among the masters of Roman eloquence. The exhibition of this feeling was directed personally to the hero: the rest of the imperial house could claim no share in it. When Livilla, the wife of Drusus, herself the sister of the lamented prince, brought forth at this time a twin-birth of sons, and Tiberius proudly boasted that never before had such good fortune befallen a parent so illustrious, the people took no part in his rejoicings, but rather murmured at an event which seemed to add weight and influence to a rival branch of the Cæsarean family.[3]

Demonstrations of grief on his death.

The arrival of Agrippina and her mournful equipage, first at Brundisium, and presently in the city, awoke the sorrows of the people to a louder and if possible a more universal explosion. The funeral honours granted by the emperor were not wanting in decent solemnity. He ordered the magistrates of every district through

Arrival of the remains at Rome. A. D. 20. A. U. 773

[1] Suet. *Calig.* 5.; Tac. *Ann.* ii. 82. [2] Tac. *Ann.* ii. 83.

[3] Tac. *Ann.* ii. 84. Of these children one was Tiberius Gemellus, whose name will appear again on these pages: the other seems to have died in infancy.

which it passed to meet and attend it on its way; he directed that tribunes and centurions should bear the urn on their shoulders, and the altars of the Dii Manes should smoke with propitiatory sacrifices. Drusus, with the younger brother and children of Germanicus, went forth as far as Tarracina to meet it: the consuls, the senate, and a large concourse of all ranks fell in with the procession as it drew nearer to the city.[1] But one thing seemed still wanting to complete these funeral honours. The emperor, the chief of the house which had lost so distinguished a member, the chief of the state which mourned so cherished a hero, was himself absent. Even within the city, and after the dear remains had been consigned to the Cæsarean mausoleum, Tiberius abstained from appearing in public, and letting his people behold him in the same garb of mourning as themselves. Livia also maintained a similar reserve; nor less did Antonia herself, the mother of the deceased. The suspicions already current against Tiberius and the aged empress were confirmed by this unaccountable coldness: it was rumoured that they kept close within the palace lest the people should discover that under the guise of sorrow their eyes were really tearless; and Antonia, it was believed, was forbidden to attract attention to their absence by showing herself to the citizens.[2] These surmises were, perhaps, hardly fair. Tiberius may have had no personal affection for his nephew: he was probably jealous of him, and mortified at his popularity: in the midst of the wailing citizens he, at least, might have been no genuine mourner. Yet

Funeral honours paid them by the people.

Reserved demeanour of Tiberius and Livia.

[1] Other extraordinary signs of grief are recorded by Suetonius, *l. c.* Even foreign princes laid aside their royal ornaments on the day when this solemnity was reported to them; the king of the Parthians [illegible]ned from the state exercise of hunting.

[2] Tac. *Ann.* iii. 3.

it is difficult to suppose that one so long trained in dissimulation would have found it hard to cast a decent cloud over his countenance, and a man so crafty and politic as he is represented, would have affected at least the feeling of the hour, however little he may have really shared it. The fact is, however, that the breast of Tiberius was something very different from a mere calculating machine. He had strong feelings, and even violent prejudices on certain points of conduct. He detested all outward expression of sensibility from temper rather than policy. The lightness and frivolity of the Italian character, enfeebled as it now was by moral and sensual indulgence, its vehement gesticulations, its ready laugh or sigh, its varying smiles and tears, he despised with cynical indignation. Self-sufficing himself, and always self-controlled, he scorned the woe or the pleasure which seeks relief or sympathy from any outward demonstrations. There was, moreover, a dogged obstinacy about him which forbade him in this case to yield to the wishes and expectations of the people, just as on a former occasion he had held out morosely against the reasonable inclinations of Augustus. He was in fact one of those very unamiable men who subject their conduct to harsh interpretations from mere perverseness of temper, and the dislike and distrust they create in the breasts of those around them. In certain positions in life such men are unavoidably thrust into crimes, and into such we shall soon find Tiberius impelled without the power of resistance. But it is probable that at this period at least he was much misconstrued, and the time has not yet come to employ those sable colours in which the brush of his delineator must eventually be dipped.

The injustice, indeed, of the historians generally, and even of a Tacitus or a Suetonius, could track him no further in his tomb; but it is not too much to say

that the injustice of the Romans of his own day went far to confirm the vices, and exasperate the hatred, they so impatiently proclaimed. Such was the inconsistency of his character that Tiberius was keenly alive to the popular opinion which he allowed himself so wantonly to outrage. He had long felt soreness and resentment at the distaste his countrymen had from an early period evinced for him. Mortified at the disappointment of his wish, if not his efforts, to conciliate them, not the less was he piqued at the success of his predecessor in the same course, from whose artifices his own pride revolted. The wound festered in silence and concealment. Conscious of unpopularity himself, he became jealous of every mark of popular favour towards others, and conceived by degrees a deadly fear of the guileless multitude of dupes and drones around him. Speaking of his position in relation to his people, he is said to have used the expression *I hold a wolf by the ears.*[1] The description was a totally false one: it was the excuse of a coward to himself, which he sought presently to justify by acts of spasmodic ferocity; but the populace, meanwhile, unconscious of its master's alarms, and alive only to his infirmities, indulged in the luxury of woe with a levity as frivolous as it proved eventually fatal. Not content with maliciously comparing with this neglect of Tiberius the warm feeling exhibited by Augustus on the death of Drusus, his going forth two hundred miles in the depth of winter to meet the bier, conveying it in person into the forum, and pronouncing the funeral address from the rostra, they lavished all their praises and acclamations on the widow of their favourite, declaring her the true glory of Rome, the

Tiberius checks the flow of popular feeling.

[1] Suet. *Tib.* 25.: "Ut sæpe lupum se auribus tenere diceret." Donatus on Terence (*Phorm.* iii. 2. 21.) gives the Greek proverb: *τῶν ὠτῶν ἔχω τὸν λύκον· οὔτ' ἔχειν οὔτ' ἀφεῖναι δύναμαι.* Baumgarten Crusius on Suet. *l. c.*

only genuine child of their late master, the last surviving specimen of ancient virtue.[1] Their vows for her safety were mingled with passionate adjurations for the health and happiness of her offspring, and their escape from the perils which surrounded them. Tiberius chafed at these ebullitions of ill humour, and was provoked to check them by an edict, in which he gravely declared that many noble Romans had died for the republic, but none had been bewailed with such an outburst of sensibility. It was well, he said, that it should be so, well for himself and for the people; but let some moderation be observed. There was a certain dignity and reserve becoming a prince and an imperial people, which might be disregarded by private persons and petty commonwealths. Enough had been given to sorrow: let them remember the example of the divine Julius on the loss of his only daughter, of the divine Augustus on the death of his grandsons. How often had the Roman people borne with firmness the rout of its legions, the slaughter of its generals, and the overthrow of its noblest families! *Princes are mortal, the state is eternal. Let every one return to his affairs: let every one*, he added,—for the season of the Megalesian games was at hand,—*let every one resume his amusements.* And so the great tide of life closed over the remains of Germanicus.[2]

Piso refers his cause to the emperor.

While he was thus sowing the seeds of a long and deep misunderstanding between himself and his people, Tiberius was reflecting, with gloomy misgivings, on the late proceedings of Piso. Though morbidly jealous of any encroachment on the paramount authority he claimed at home and abroad, he was not the less fixed in his resolution not to obtrude it on general notice by a direct

[1] Tac. *Ann.* iii. 4.: "Decus patriæ, solum Augusti sanguinem unicum antiquitatis specimen."

[2] Tac. *Ann.* iii. 6.

vindication. His aim was to throw on the senate the burden of defending the prerogatives it had, as he pretended, spontaneously conferred on him. Accordingly, while he watched the acts of the proconsul, scrutinized his motives, and strove to penetrate his designs, he was not less vigilant in observing the disposition of the nobles, and estimating the support they would tender to himself. Piso's daring attempt to recover a province from which he had been officially dismissed was an insult to the government: but would the senate regard it as an insult to itself? —did it identify the emperor's cause with its own? —might it not rather decline to interfere between the master and the instrument he had himself chosen, and lean, at least in inclination, to the side of a member of its own body, in opposition to the authority which rivalled and controlled it? Such considerations as these, which Piso himself fully understood, weighed forcibly on Tiberius, and made his measures appear uncertain and vacillating. The culprit relied on the boldness and decision of his attitude. When required by Sentius to refer his cause to the judgment of the emperor, he did not hesitate to accept the challenge. From the coast of Cilicia he had proceeded in the direction of Rome; nevertheless he did not care to betray by his haste any symptoms of anxiety. He travelled slowly from city to city, and instead of taking the direct route by Dyrrhachium and Brundisium, sent his son in advance with letters full of obsequious deference to the emperor, while he stepped himself aside into Dalmatia to obtain an interview with Drusus, who had returned there from attending the obsequies of Germanicus. Tiberius received the young man with courtesy and even favour. Drusus, on the other hand, whose demeanour was generally open even to bluntness, affected a reserve and caution, in which he had evidently been instructed by his father, but assured

Piso of his hope and trust that the rumours about the manner of the Cæsar's death would prove entirely groundless.[1]

He reaches Rome.

The minds both of the citizens and the chiefs of the state being in a feverish state of excitement every step the culprit took became a matter of suspicion and misconstruction. If on landing at Ancona he fell in with a legion on its march to Rome, having been removed from Pannonia under orders for Africa, and accompanied it for some miles on its route, it was reported that he had unduly courted the favour of the officers and soldiers; if, again, he left it at Narnia, and betook himself to the easier transport of a vessel down the Tiber, it was suggested that his conscious guilt sought to avoid just suspicion, or that his treasonable plans were not yet fixed and mature. It was charged against him as a grave misdemeanour that he had allowed his bark to be fastened to the walls of the Cæsarean mausoleum on the margin of the Campus Martius. The pomp and even the affectation of cheerfulness with which he took his way into the city, attended by a retinue of clients, together with his wife Plancina, and a bevy of her female friends, gave umbrage to a populace bent on taking offence. They pointed with malicious spite, as their ancestors might have done two or three centuries before, to the mansion of the Pisos overhanging the forum, in proud defiance of the commons below, and resented, as tokens of guilty ambition, the laurels and flags with which it was decorated to receive its long absent master; nor less at the number of friends and courtiers, who repaired thither to salute him and partake of his hospitality.[2] The death of the poisoner Martina, which occurred suddenly on her passage to Rome, was regarded by many as a device of the accused himself, or was taken as an indication of collusion between him and his prosecutors.[3]

[1] Tac. *Ann.* iii. 7, 8. [2] Tac. *Ann.* iii. 9. [3] Tac. *Ann.* iii. 7.

Such being the temper of the public mind, and so strong the appearances of Piso's double guilt, there could be no lack of accusers to spring up, and seize the occasion to make a show of their eloquence, their zeal for law and justice, their love for the Roman people and the family of their ruler. It might rather be apprehended that the ends of justice would be defeated by the precipitation of intemperate assailants, or even by the false play of pretended enemies. Accordingly when Fulcinius Trio, a young noble, ambitious of notoriety, came forward, the day after Piso's arrival, to lodge an impeachment against him, the real friends of Germanicus, those to whom he had personally committed the vindication of his cause, were alarmed for the success of their maturer plans. Two of these, Vitellius and Veranius, immediately entered the court, and protested against Trio's right to prosecute at all, declaring at the same time for themselves that they were not come to declaim in behalf of Germanicus, but to attest by their solemn evidence the fact of Piso's criminality. These representations were judged to have weight, and Trio was refused permission to make his oration against the culprit, as regarded his alleged misconduct in the East: he was indulged, however, with an opportunity of uttering an harangue on the early career of Piso, and of blackening his character, to the extent of his ability, by a general defamation. Such were the facilities the Roman procedure gave to the young and ambitious declaimer: but attacks like these were mere empty displays of rhetoric, and served no purpose but to amuse the idle or gratify the malicious. Meanwhile Piso's friends, disregarding such frivolous demonstrations, and fixing their attention on the real point of attack, were striving to secure the emperor himself as judge in the case; for the emperor's consular or tribunitian power gave him formal jurisdiction in criminal trials, when-

His accusers prepare their process against him.

ever he chose to exercise it. Piso had every reason to shrink from an appeal to the people; nor was he without grave apprehension of the bias of the senators against him. His best chance of a favourable, or even of a fair hearing, lay before the tribunal of Tiberius himself, who had at least no partiality for Germanicus, and who, it was well known, was indisposed to parade himself as the author of strong measures against senators and nobles. But Tiberius, on his part, shrank from the invidious position of a judge in a case so delicate. Not directly refusing the onerous responsibility, he seated himself indeed on the bench with certain of his own intimates as his assessors; but after listening for a time to the denunciations of the one party, and the obtestations of the other, he finally remitted the adjudication of the cause intact to the senate.[1]

The trial of Piso before the senate.

Nothing now remained for the accused but to prepare his defence in the regular way. He solicited the noblest and ablest men in the city to plead his cause. L. Arruntius, Asinius Gallus, S. Pompeius, and others hardly less illustrious, refused on various pretences to defend him. M. Lepidus, L. Piso, and Livineius Regulus, at length promised to stand by him; and great was the admiration of the citizens at the confidence of the friends of Germanicus on the one hand, and the assurance of the culprit on the other; while they anxiously asked one another what the conduct of Tiberius would be, and whether he would sternly repress all personal feeling, and leave free scope to the force of truth and the influence of eloquence and reason.[2] The proceedings indeed were opened by the emperor in a speech of studied fairness and moderation.[3] He represented that Piso had been a trusty officer of Augustus, and that he had himself, not

The proceedings opened by a speech from Tiberius.

[1] Tac. *Ann* iii. 10. [2] Tac. *Ann.* iii. 11.

[3] Tac. *Ann.* iii. 12.: "Die Senatus Cæsar orationem habuit meditato temperamento."

without the consent of the senate, attached him as a coadjutor to Germanicus.[1] Whether in that capacity he had exasperated his chief by contumacy and rivalry, whether he had betrayed satisfaction at his death, or even actually effected it, it was for the senate, he said, impartially to decide: if the former, he would himself resent it as a father, but he would not judicially punish it as a prince; if the latter, it would be the duty of the senators on their part to visit the murderer with a murderer's reward, and console the family of the deceased with the vengeance which the law prescribed. He recommended them to examine carefully the charges of seditious intrigues and irregular ambition; and whether the culprit had actually attempted to recover his province by arms, or his faults had been exaggerated by the malice of his accusers, whose over-zeal the emperor felt bound at the outset to stigmatize and repress.[2] *For what right had they*, he asked, *to expose the body to the public eye, and invite provincials and foreigners to examine the pretended tokens of poison which it was impossible to test, if after all the crime was still unproved and matter of judicial inquiry?* He went on to charge the judges not to allow his private sorrow, great as he assured them it was, to influence their decision; to exhort the accused to omit no topic suitable for his own defence, or, if necessary, for the inculpation of Germanicus himself; to encourage his advocates to exert their eloquence to the utmost in the cause of the unfortunate defendant; finally, he begged all parties to disregard any popular

[1] Tac. *l. c.*: "Adjutorem Germanico datum." For the force of this expression, see above.

[2] Tacitus says, "Armis repetita provincia;" that is, he claimed by force of arms possession of *his own* province. If he had occupied a post such as Celenderis in another province, and employed its native forces, there would have been no question of the gravity of his crime, and no excuse for neglecting to animadvert upon it. A. Zumpt, *Comment. Epigraph.* ii.

surmises that might be promulgated to his own personal discredit in the matter.

Thus encouraged, or possibly perplexed and frightened, the senators addressed themselves to the work before them. Two days were allowed to the managers of the prosecution for exhibiting their charges; then after an interval of six days, three more were granted for the defence. Trio, who had thrust himself, as has been said, into the front, began with a long and desultory attack on the conduct of Piso when he formerly governed in Spain; an abuse of rhetoric only sanctioned by custom, but which could hardly produce even the petty result to which it was directed, of creating an unfavourable impression against the accused in the minds of his judges. An important part of the space allotted for the prosecution was wasted in this unprofitable skirmish. When, however, the genuine accusers stood forward with the decisive features of the case in hand, they found the tribunal, from whatever reason, so well disposed towards them, that they were not required to bring on every point the most conclusive evidence. Servæus, Veranius, and Vitellius followed one another in denouncing the culprit with equal fervour, and the last of the three with conspicuous eloquence, for his enmity to Germanicus, his intrigues with the soldiery, his attempts, only too successful, by poison and magic, against the life of his commander, and finally, his armed assault on the prerogatives of the republic. Had Piso not been first conquered as an enemy, argued Vitellius, he could not have been now prosecuted as a criminal. Then followed an interval for the judges to reflect, and for the accused to prepare his defence. On most points of attack neither refutation nor excuse was possible; the political charges were too patent to be rebutted, too flagrant to be palliated. Here at least the replies of Piso were weak and vacillating. The charge of poison, however, he did not shrink

Speeches in accusation.

Piso defends himself.

from meeting with a stedfast denial; and this, indeed, either from mismanagement on the part of the prosecution, or from the real absence of any reasonable grounds of proof, had completely broken down; for it was founded not on any alleged connexion between Piso and the notorious Martina, nor on testimony extorted from his slaves, whom he freely tendered for examination on the rack, but on the monstrous and incredible story, that, at a banquet given by the prince, while reclining at his side, he had with his own hands communicated poison to the viands on the table.[1] The rumours of magical incantations were invented perhaps for the populace of Antioch and Rome: though repeated in the presence of the senators, we hear of no attempt either to substantiate or refute them. But the judges, some on one account, some on another, were implacable. Tiberius himself could not forgive the attempt upon the province, and the senators, for the most part, were obstinately convinced that the prince had met his death by unfair contrivance. There prevailed, however, among them a vague suspicion that there had been collusion of some sort between Piso and the emperor himself. It is possible that some of the judges or the accusers ventured to suggest that Piso's instructions should be produced, and that this was refused both by the one and the other.[2] Meanwhile the people had satisfied

[1] Slaves could not be questioned by torture against their own master, except, under the emperors, in cases of treason; but he might offer them to be tortured as witnesses in his favour. Rein, *Criminal-Recht der Römer*, p. 542. Pliny mentions (*Hist. Nat.* xi. 71.) that Vitellius in his speech, still extant in the writer's day, argued that poison had been administered, from the fact he asserted that the heart of Germanicus would not burn. (Comp. Suet. *Calig.* 1.) The same, however, was believed to occur in the case of the morbus cardiacus (heartburn or cardialgia: v. Hardouin's note); and Piso pleaded that this was the malady of Germanicus.

[2] At this place there is an unfortunate lacuna in the MSS. of our authority Tacitus: the words, "scripsissent . . . . expostulantes; quod haud minus Tiberius quam Piso abnuere," seem to point obscurely to this supposition.

themselves of the full atrocity of the culprit's guilt. They surrounded the tribunal with cries of vengeance, threatening that if acquitted by his judges, they would tear the murderer to pieces with their own hands. They would have broken the busts and statues of Piso within their reach, and exposed them, in default of his own mangled limbs, on the Gemonian stairs, had not a military force arrived in time to protect them. The criminal was removed from the bar in a closed litter, attended by a tribune of the prætorians: some supposed that this was to shelter him from the popular indignation, but others already whispered that it was determined to sacrifice him.[1]

Thus ended the first day of the defence, and the culprit reentered his house with a gloomy presentiment of defeat. Thus far, however, his wife had affected to unite her cause with his, and had loudly declared that she would share his fortune for good or for evil. If the general feeling was not less strong against her than against her husband, she might indulge in warmer hopes of protection from the favour of Livia; and as long as her interests were united with his, he might trust to escape under the shelter of her superior influence. But while Piso was battling desperately for his life in the senate-house, Plancina was soliciting the empress in the recesses of the palace, keeping more aloof from him as the charges seemed to press harder, urging excuses for herself independent of him, and finally separating her cause from his altogether. As soon as Piso discovered this, his last hope was gone. Hesitating to confront his accusers again, he was with difficulty prevailed on by his sons to nerve his resolution for a second appearance before his judges. There he heard the charges once more repeated, and underwent interrogations which

Deserted by Plancina, Piso commits suicide.

[1] Tac. *Ann.* iii. 13, 14.: "Vario rumore, custos saluti an mortis exactor sequeretur."

seemed to wax more manifestly hostile: but when he looked towards Tiberius, and observed how cold and reserved was his demeanour, how studiously he repressed every mark either of compassion or anger, he felt that his doom was inevitable. Carried back once more to his own dwelling, he called for his tablets, as if to compose the peroration of his defence, wrote a few lines, which he sealed and delivered to a freedman, after which he bathed and dressed as usual for supper, and retired, after taking it, to his couch. At a late hour of the night, seizing the moment of his wife leaving his bedchamber, he ordered the doors to be closed. The first who entered at daybreak discovered him lying with his throat severed, and his sword on the ground beside him.[1]

Rumour that Piso was put to death by the emperor's order unfairly countenanced by Tacitus.

Such an end at such a moment gave rise to many whispered surmises. The Romans, ever prone to suspect foul play and underhand contrivance, could easily be led to impute the catastrophe to the emperor himself; and it is worth while to notice that our historian reveals to us on this occasion the questionable sources to which we seem to owe many of his gravest incriminations. *I have heard old people mention*, he says, *that Piso had often certain papers in his hand, the contents of which he did not publicly divulge; but that his friends used to affirm that they were the actual instructions addressed to him by Tiberius regarding the unfortunate Germanicus. These he had resolved to lay before the senators, and reveal the real guilt of the emperor, had not Sejanus, the confidant of Tiberius, dissuaded him by false hopes from his purpose. They added that he did not kill himself, but was, in point of fact, assassinated.*[2]

[1] Tac. *Ann.* iii. 15.

[2] Tac. *Ann.* iii. 16.: "Quorum neutrum asseveraverim: neque tamen occultare debui narratum ab iis qui nostram ad juventam duraverunt"

The writer concludes this narration, however, with cautioning the reader that he does not affirm this circumstance as an ascertained fact; and such, it must be remarked, is too frequently his habit, to be excused, perhaps, only from the paucity of trustworthy documents in his reach,—to insinuate the truth of popular rumours under pretence of merely recounting them. It is not too much to assert that he really means us to believe most of the stories he thus repeats, under the protest that he cannot vouch for them. With this caution against the seductive influence of the most eloquent of historians, I return to the narrative before us.

Sentence against Piso.

Tiberius expressed, it seems, his mortification at the death of the criminal: he might easily foresee and deplore the suspicions to which it would expose him. He allowed the son of the deceased to read to the senate the last words his father had written, which were now found to contain a vindication of his own children from the charge of treason from which he had failed to relieve himself, and an appeal to the emperor in their favour, by the five and forty years of his own faithful services, by the consulships accorded him by Augustus, and the friendship extended to him by Tiberius himself. Such, he said, was his last dying petition. Of the false Plancina he made no mention at all. The case for the defence being thus abruptly cut short, the accusers might still use their right to reply. But the senators were not unmoved at the spectacle of war still waged against a prostrate and insensible victim. They were satisfied with expunging Piso's name from the Fasti, and confiscating a portion of his estates, decreeing at the same time that his elder son Marcus should be banished for ten years, and Cnæus, the younger, renounce the prænomen he had derived from his father. Tiberius interfered to obtain some mitigation even of this sentence, protesting that it was too much to dis-

grace the name of Piso, when that of Marcus Antonius, who had fought against his country, and of Julus, who had dishonoured the imperial house, were allowed to retain their place in the rolls of honour. He spared also the property of the deceased, on this, as on other occasions, displaying a laudable abstinence in this respect. But he had used his influence, in deference to his mother, to screen Plancina from prosecution; and so poignantly did he feel the disgrace of this interference, so much was he mortified at the murmurs of the citizens, as to seek to repair his credit by a show of lenity and moderation towards her husband and family. At the same time, he restrained the adulation which would have decreed him extraordinary honours for thus avenging the loss of Germanicus. It was no matter, he protested, of public joy and thanksgiving; it was the last act of a domestic calamity, fit only to be buried in the recesses of his own memory. Upon the accusers, however, he bestowed places in the priesthood, and promised to elevate Trio to civil distinctions, cautioning him at the same time to use his powers of oratory with temper and discretion in future.[1]

Tiberius free from all suspicion in regard to the death of Germanicus.

A calm review of the circumstances of this celebrated trial seems to leave no cloud of suspicion on the conduct of the emperor himself. It results clearly from the acknowledgments of the narrator, whose hostility to Tiberius is strongly marked, as we shall see, throughout the course of his history, that the evidence in proof of the murder was completely nugatory. Still less does there appear any reasonable ground to implicate Tiberius himself in the schemes of Piso, even supposing Piso's guilt in this respect to be still matter of question. The fault, which gave rise to the most unfavourable surmises, lay in his want of firmness and decision in conduct-

No proof of the murder.

[1] Tac. *Ann.* iii. 17—19.

ing the case. However deeply irritated at his proconsul's contumacy, he could not divest himself of the jealous distrust of his too subservient nobles, which impelled him constantly to throw on them the responsibility of an inquiry, which, as chief of the state, was legitimately his own. The position he held was a source of unceasing alarm and anxiety to him. Already he found himself beset by the first dangers of an intruding dynasty, the repeated apparition of rival claimants and pretenders. The first steps of his illustrious predecessor had been dogged by the upstart Amatius. At a later period Augustus had been persecuted by a bold impostor, who declared himself the real son of Octavia, for whom Marcellus had been substituted by fraud.[1] The death of the wretched Postumus was speedily followed by the enterprise of one of his slaves, named Clemens, who pretended to represent him. On the decease of Augustus, this man, we are told, formed the design of hastening to Planasia, and carrying off his master to the legions on the Rhine. He might have succeeded, but for the slowness of the merchant vessel in which he sailed for the island. On arriving there he found the prince already despatched. Conceiving at once a still more daring project, he secreted or dispersed the ashes of the murdered man, to destroy the evidence of his death, and retired for a time to Cosa, on the opposite coast of Etruria, till his hair and beard were grown, to favour a certain likeness which he actually bore to him. Meanwhile, taking a few intimates into his confidence, he spread a report, which found ready listeners, that Agrippa still lived. He glided from town to town, showing himself by twilight, for a few minutes only at a time, to men prepared for the sudden apparition, until it became noised abroad that the gods had saved the grandson of Augustus from the fate intended for him,

Enterprise of the Pretender Clemens. A. D. 16. A. U. 769.

[1] Val. Max. ix. 15. 2.

and that he was about to visit the city and claim his rightful inheritance. At Ostia, Clemens was received by a great concourse of people, and numbers repaired privily to him on his entrance into Rome. It was long, however, before Tiberius could resolve to act vigorously against him. He would rather have left the vulgar imposture to die a natural death, than interfere to check it with the bruit of arms. At last he determined to exert himself. The pretender was speedily entrapped, by two simulated believers, and brought bound to the palace. When asked by Tiberius what right he had to assume the name of Agrippa? *The same*, he replied, *that you have to that of Cæsar.* The names of no loftier accomplices could be extorted from him, and it is probable that the design was from first to last merely a wild conception of his own. Tiberius was glad to bury the whole matter in oblivion. He put the man to death in the recesses of the palace, and had the body secretly removed, nor did he cause inquiry to be made into any circumstances of the attempt, though some of his own family and many knights and senators were said to have privily favoured, and even given money to advance it. Such was the received account of the affair; as much, that is, as the emperor chose to reveal, or the people ventured to guess of it.[1]

Intrigues of Libo Drusus. A. D. 16. A. U. 769.

But the sally of an obscure slave was far less formidable than the intrigues of illustrious nobles, equals of the emperor himself in birth and ancestral honours. It was a tradition of the party which Tiberius historically represented, that every scion of a consular house was a possible candidate for the empire; and if his own jealousy ever slept for a moment, officious advisers were not wanting to excite his fears, and urge him to renewed vigilance. A young noble named Libo Drusus, of the Scribonian gens, the same which had given consorts

[1] Tac. *Ann.* ii. 39, 40.; Suet. *Tib.* 25.; Dion, lvii. 16.

to both Octavius and Sextus Pompeius, was suspected, from the accession of Tiberius, of cherishing the project of supplanting him. His juvenile ambition had been fostered by the artifices of a pretended friend, who had tampered with the weakness of his character, and led him into criminal relations with the soothsayers and diviners, who were casting the horoscopes of the unwary, and flattering with dangerous dreams every illicit aspiration. Libo admitted to his bosom the wildest hopes of fulfilling the pretended destiny of his illustrious ancestors. The sharer of his counsels betrayed them in due time to the emperor. Such, however, was the apprehension Tiberius entertained of the influence of a noble name, that he did not venture at once to check him. On the contrary, he continued for more than a year to load him with honours; while such was his fear of personal violence, that, when Libo assisted him at a sacrifice, he caused him to be furnished with a knife of tin; and in conversing with him, pretended always to lean confidentially on his arm, to prevent him from drawing forth the weapon which he might carry beneath his girdle.[1] It was not till he had obtained distinct proof that Libo had consulted a magician, who pretended to evoke the dead for unhallowed inquiries, that Tiberius ventured to convene the senate, *to deliberate*, as the tenour of his summons ran, *upon a dreadful and monstrous crime*. Libo was soon made aware of his danger. He clothed himself in mourning, and glided from house to house, suing in vain for the advocacy of his illustrious friends. All shut their doors, or turned their backs upon him. On the day of the trial, he appeared in the senate without a patron, and studied only to excite commiseration by real or pretended sickness. Of accusers there was no lack. Among them was Firmius, the false friend already noticed, and Fulcinius Trio, the rabid declaimer. The

[1] Suet. *Tib.* 25.

charges produced embraced some of the wildest fictions. One of the prosecutors asserted that he had been promised gold enough to pave the Appian Way to Brundisium. On this and other testimonies scarcely less trivial, it was determined to examine his slaves; and as the law forbad the examination of a master's slaves against him in a capital case, Tiberius caused them to be enfranchised before subjecting them to the question. Libo now felt that his fate was decided. Returning home, after the first day's investigation, for as yet the personal liberty of the noble Roman was never restricted, even under a capital charge, he sat down to table, but after some hesitation, accomplished his own destruction.[1] The prosecution was carried on notwithstanding; and when the culprit's guilt was finally declared to be proved, Tiberius asserted that he intended to pardon him, had he allowed him the opportunity.[2]

Apprehensions of Tiberius.

The readiness of the senators to combine against the presumed enemies of the prince, the zeal with which they vied with one another in leading the prosecution against them, the eagerness with which they united in decreeing their death, and the confiscation of their property, all these tokens of devotion might have reassured even the fears of Tiberius, and made him feel secure of the submission of his courtiers. But it seems to have had rather the contrary effect of alarming him. He saw in it the most fatal evidence of the degradation of the Roman character, and he augured from it that the time would arrive when, every bond of religious feeling being broken, the loyalty with which Augustus had inspired his subjects would give way to selfish passions, and the man who should succeed in out-bidding

[1] Thus when Cicero assigned the Catilinarian conspirators to the custody of certain nobles, the legal fiction of their freedom was ostensibly respected.

[2] Tac. *Ann.* ii. 27—31.

him in popularity would become master of their venal affections. These apprehensions were increased by every expression of freedom hazarded by his anticipated rivals, which he presumed to be grounded on the conviction that their time was coming, and that there was in the community a large mass of feeling which responded to their pretensions. Among the nobles there was a certain class who affected to indemnify themselves for the loss of substantial liberty by petty sallies of impatience, and scarce disguised irony, and among these Piso had been eminently conspicuous. Thus, for instance, when Tiberius had announced, on a certain occasion, that, contrary to his usual reserve, he would give his opinion on a particular charge in person, Piso ventured to ask, would he speak first or last?—*if first*, he added, *I shall have a guide to follow; if last, I fear lest I may unwittingly dissent from you.* Such, says Tacitus, were some of the last traces of expiring liberty.[1] While, however, any such traces, however slight, still remained, the shadowy phantom of the Republic continued to flit before the eyes of the Cæsar. There was still, he apprehended, a germ of sentiment existing, on which a scion of his own house, or even a stranger, might boldly throw himself, and raise the standard of patrician independence. The death of Piso concurred with that of Germanicus to relieve him from the terrors of this hateful anticipation. From this time he began really to reign. He was well aware, indeed, that he had fastened on himself the hatred of the citizens by the mere suspicion of his complicity in deaths which had so manifestly served his interests; he knew that all his acts and measures would henceforth be construed to his injury, and a dark cloud of national distrust hang for ever on his memory. But, on the other hand, these were the mere shadows of

Relieved by the deaths of Germanicus and Piso.

[1] Tac. *Ann.* i. 74. Comp. ii. 35.

evil. To the loss of his good name he was becoming more and more hardened. The flattery of poets and historians, even the clamorous applause of the populace, he could buy again if he chose; but with his cynical contempt for his people, he did not think them worth the cost in shows and largesses. He now felt himself safe from the machinations of his nearest enemies, and free to exchange the disguised autocracy of his predecessor, which he wanted himself the tact and moderation to wield, for the direct and harsh exercise of uncontrolled dominion.

Nevertheless, while Tiberius was thus rising supreme over the laws of his country, and the lives and fortunes of the citizens, he was not himself exempt from certain concealed and mysterious influences, which continued almost insensibly to direct and control him. The first of these was the will of Livia, who seemed now, in extreme old age, to reap the full fruits of her ambition, the passion to which she had subjected every other inclination through her long career of intrigue. Her son had risen under her auspices, and mainly, perhaps, by her direct contrivance, to the summit of power which she had so deeply coveted for him, and her own influence over him had increased rather than diminished with his success. All Rome regarded the empress-mother with far more awe and obsequious submission than the empress-consort. If she had really been the mistress of the councils of Augustus, he at least had retained the ostensible power. But the habits of obedience she had early impressed on her son remained deeply stamped on his retentive disposition; nor, however much her yoke might sometimes gall him, had he the spirit to reject it when he became the master of all the world besides. The women whom she admitted to her intimacy presumed to defy the laws under her protection. On one occasion her favourite, Urgulania, being cited as a witness

Secret influence of Livia,

before the senate, refused to appear, and the prætor was complaisantly sent to take her examination in private, a privilege not accorded even to the sacred character of the Vestals.[1] On another, the same Urgulania was the cause of a struggle for supremacy between Tiberius and his mother. It was considered a remarkable instance of firmness on his part, that he insisted on her paying down the fine imposed on her by a judicial sentence. But the greatest triumph of Livia's authority was seen in the acquittal of her friend Plancina. The emperor, consummate as was his power of dissimulation, failed to disguise the disgust he felt at the part he was reduced to play in deference to this love of power.

and of Sejanus.

Another influence behind the throne has already been glanced at, in accounting for the jealousy Tiberius felt of the martial aspirations of Germanicus. The most eloquent of the emperor's flatterers, in concluding his brief survey of Roman history which has come down to us, with a review of the opening promise, such as he represents it, of this ill-fated reign, after painting in flaunting colours the virtues and successes of the third Cæsar, glides into the reflection, that the good fortune of the greatest men is generally to be traced in part to the merits of their most cherished advisers. Thus the valour of the Scipios was supported by the genius of the Lælii, and Augustus himself reclined on the arms of an Agrippa and a Taurus. In like manner, he adds, did Tiberius rejoice in the powerful aid of Lucius Sejanus, a man of rare ability, vigorous alike in mind and body, a loyal servant, a cheerful companion, one whose natural modesty evinced his actual desert, and smoothed the way for his well-merited advancement.[2] This and much more does Velleius

[1] Tac. *Ann.* ii. 34.: "Tiberius hactenus indulgere matri civile ratus."

[2] Velleius Paterculus, ii. 127.

say in the praise of the favourite of Tiberius, the man whose name has become a by-word in history for all that is most fulsome in adulation, most base in dissimulation, most atrocious in crime. Sejanus belonged to the Ælian gens, perhaps by adoption, and his paternal family was only of equestrian rank.[1] On the mother's side he is said to have descended from a more illustrious ancestry. He was born at Vulsinii in Etruria. He seems to have first established his fortunes on the favours of a wealthy debauchee[2], but when he succeeded in attaching himself to the person of the young Caius Cæsar, the prospect of public eminence began to open upon him. On his second patron's premature decease he transferred himself to the service of Tiberius, over whom he soon acquired an influence, which it became the object of his life to confirm and extend. But the arts by which such influence is obtained over a timid and self-distrusting character, however sly and suspicious, do not always imply any great superiority of talent; and the enemies of Sejanus refused to allow the object of their abhorrence the praise even of eminent talents. They would only admit that he was active and hardy in frame, and was not deficient in boldness and enterprise: he had, they said, the address to conceal his own vices, while he was shrewd in unmasking the disguises of others. His pride and meanness were equal one to the other, and he could carry a pretence of moderation in his demeanour, while his lust of power and lucre was really unbounded.[3]

On his patron's succession to the empire, Sejanus was found useful, and retained the influence he had

[1] L. Ælius Sejanus was the son of Seius Strabo, a Roman knight.

[2] Tac. *Ann.* iv. 1.; Dion, lvii. 19. This was M. Apicius, the second of the three noted gourmands of the name, who are supposed to have flourished in succession from the time of Augustus.

[3] Tac. *l. c.*; Dion, *l. c.*

acquired by his skill in relieving him from the weight of his burdens without seeming to take them on himself. Tiberius sent him on a confidential mission to advise the young Drusus in Pannonia; but he was speedily recalled from this distant service, and appointed colleague with his father in the command of the prætorian cohorts, quartered in the vicinity of the capital. This charge placed him in a position of the strictest intimacy with the emperor, over whose personal safety it was his duty to watch, while he provided for the execution of his orders in Rome. Here he may have suggested that distrust of Germanicus to which the Romans ascribed the hero's recall from the Rhenish frontier; he may have prompted the mission of Piso, as a check on the presumed ambition of the young prince in Asia; he may have whispered to the proconsul of Syria an assurance that his opposition to his chief would not be distasteful to the sovereign power at home. However this may be, Tiberius required a staff to lean upon, and Sejanus was strong enough and bold enough to supply one. Anxious as the new emperor was, from his first accession, to know everything, and to do everything himself; impatient as he was of leaving affairs to take their course under a wise but distant superintendence, and jealous of all interference with his own control; yet, finding day by day that the concerns of his vast administration were slipping away beyond the sphere of his personal guidance, from the inability of any single mind to embrace them all together, he was reduced to the necessity of falling back on extraneous assistance; and he preferred, from the character of his mind, to draw irregular aid from a domestic favourite, rather than throw irresponsible power into the hands of his remote vicegerents. He controlled the satraps in his provinces by the agency of a vizier at home.

Sejanus prefect of the Prætorian guards.

CHAPTER XLIV.

The functions of the comitia: 1. Election of Magistrates; 2. Legislation; 3. Jurisdiction: transferred to the senate, and hence to the emperor himself.—The emperor's control over the senate.—The law of majestas: its origin, application, and extension under Tiberius from acts to words and injurious language.—Cases of constructive majestas.—Delation encouraged by Tiberius.—Consolidation of the Roman dominions under Tiberius.—Stations and discipline of the legions.—The government and improved treatment of the provinces.—Government of Italy and the city.—Dissipation of the times.—Measures of Tiberius.—His own vices and virtues.—His deference to the senate.—Defects of temper and demeanour.

General result of the struggle between democracy and aristocracy.

THE democracy, when roused to deadly struggle against the aristocracy, generally gains the victory; but the fruits of victory it has seldom the capacity to retain. The empire of the Cæsars was founded, as we have seen, on the passions and just claims of the popular branch of the Roman community; but while the show of power, its trappings, and even its emoluments, fell again into the hands of the nobility, the real substance eluded, as usual in such cases, the grasp both of the one and the other. We have already remarked the care of Augustus to raise the dignity of the senatorial order, while he repressed all free action in the commons, and deprived them, one by one, of the prerogatives they had acquired through so many revolutions. Though the descendant and representative of Marius, he was in fact, as regarded the relations of the two rival orders of the state, no other than a second Sulla.[1]

[1] See Hoëck's *Röm. Gesch.* i. 3. p. 50. foll. I have found the advantage of having before me this author's luminous view of the constitution of the empire under Tiberius.

The balance trimmed by the tact of Augustus.

But whatever remained to be done, to reduce the Roman plebs to utter insignificance, was speedily effected by the regulations of Tiberius. The balance between the conflicting powers of the state was only trimmed for the moment by the sagacity and fortune of Augustus, for whom all parties were content to waive the exaction of their legitimate or pretended rights. When a successor followed, with less personal authority and less delicacy in the management of it, the machine of government might have been in danger of collapsing. The appointment of magistrates, the enactment of laws, the constitution even of the judicial tribunals, had all been left unfixed in principle, and abandoned, as occasion arose, to the wisdom and moderation of the emperor, on which all equally relied. The Romans acquiesced in the fiction which was now palmed upon them of equal laws and a regular constitution: but in fact the limits of every department of government were normally undefined. This was a state of things which, however passive in temper the mass of the nation had now become, could not longer endure in the face of a restless and sensitive nobility.

More logical character of the polity of Tiberius.

Tiberius, moreover, from the character of his mind, required a more logical development of the polity he had undertaken to direct, and that polity had begun spontaneously to assume, as the condition of its existence, both outward form and internal organization.

The threefold functions of the Comitia.

The transfer of the business of the popular assemblies to the senate is announced, as we have seen, by Tacitus with a coolness and indifference which may seem scarcely worthy of its apparent importance. Whatever the aspirations of the historian may have been for the so-called liberty of the old aristocracy, the traditions of which he has hallowed by his deep and melancholy regrets, it is probable that no Roman of his day, the second

century from the loss of independence, really felt the value of the forms of the free-state, which had so long passed from degradation to oblivion. But in fact the change which he here announced was less important than at first sight it appears. On the other hand, the action of the Comitia had been already paralysed for half a century, and was now only quickened occasionally by the emperor himself to serve his own purposes, while, on the other, its presumed functions, though thus ostensibly abolished, were not in reality absolutely extinguished. The functions of the Comitia, whether the people met by tribes or centuries, were properly threefold, those of Election, of Legislation, and of Jurisdiction; and it will be desirable to pause at this point of our narration, to review briefly the position in which the empire found these functions respectively.

I. The popular privilege of election, whether of the higher or the lower magistrates, had been limited by the first Cæsar, and after him by the triumvirs. In the plenitude of their confidence, the people had urged their patron, the Dictator, to assume the sole nomination to all civil offices; and it was by a mere act of grace on his part that the free choice of one-half of them was remitted to the popular assemblies, while of the other he accepted only the right to nominate and recommend, the latter act being of course virtually equivalent to a direct appointment.[1] The proceedings of the triumvirs were merely irregular and revolutionary.[2] They grasped the direct appointment of all: but it was among the first cares of Augustus, on succeeding to his parent's inheritance, to return to the principles set forth by Cæsar, and restrict himself to the nomination of one-half of the magistrates, leav-

I. The election of magistrates.

[1] With the exception of the consuls, the appointment of whom he reserved solely to himself. Dion, xliii. 45. See vol. ii. ch. xxi.

[2] Appian, iv. 2., v. 73.; Dion, xlvii. 15., xlviii. 35. 53.

ing to the assemblies of the tribes and centuries the unfettered election of the rest. He claimed only a veto on the nomination of unworthy candidates; but while he reserved to himself the decision of what should constitute merit or demerit, he reduced in fact the succession to all places of trust and power to a matter of personal favour. Such was the pretended restoration of the prerogatives of the people, for which Augustus obtained credit[1]: it was a part of the general system of dissimulation with which he deceived a willing people, a system which could only succeed in the hands of one whose personal merits were dearer to them than any consistent theory of government.

Augustus nominates magistrates to the Comitia.

It was with a peculiar feeling of complacency that they beheld, year after year, the solemn mockery of the emperor's descent into the Field of Mars, when he led his clients by the hand, recommending their claims, and asking for them the suffrages of all comers, till he finally registered his own vote in their behalf.[2] Such was the practice of Augustus through the greater part of his long reign. Towards its close, when he could less easily bear the fatigue of this repeated exertion, he contented himself with furnishing his nominees with written credentials, and spared himself the trouble of attending personally with them.[3] Even this was not precisely a novelty; it was following the precedent of the Dictator, and it was accepted by the people as a sufficient recognition of their ultimate right of election. They continued to go through the ancient forms of polling, with the bridge, the penfold, and the urn; and with respect at least to those

[1] Suet. *Oct.* 40.: "Comitiorum pristinum jus reduxit." Dion, lvi. 46.: τὸ τε ἀξίωμα τῶν ἀρχαιρεσιῶν αὐτῷ ἐτήρησε.

[2] Suet. *Oct.* 56.: "Quoties magistratuum comitiis interesset, tribus cum candidatis suis circumibat, supplicabatque more solemni. Ferebat et ipse suffragium, ut unus e populo."

[3] Dion, lv. 34.: γράμματα τίνα ἐκτίθεις συνίστη τῷ τε πλήθει καὶ τῷ δήμῳ ὅσους ἐσπυύδαξε.

places to which the emperor abstained from nominating, a stranger only historically conversant with the system of the free-state might have found perhaps nothing in the methods of procedure to awaken him from his dream of the republic of the Scipios.

With an instrument of government so conveniently adjusted to his hand, so facile and flexible to every touch, it is not likely that Augustus ever thought of placing further restrictions on the pretended freedom of election. Tiberius, however, found it advisable to announce that the reform which he himself meditated had already been conceived and planned by his predecessor.[1] But the transfer of power, or rather of the show of power, which he made, did not extend to closing the assemblies either of the tribes or centuries for purposes of election. While he continued the system of nomination and recommendation, addressing it not to the Comitia but to the senate, he still allowed the people to meet in their accustomed places, and with the ancient forms, to accept and ratify the choice of the superior order.[2] Hence we find the term Comitia still occasionally employed, though not quite correctly, to represent the election of magistrates; and the meetings of the people in the booths or septa, and on the

Tiberius nominates to the senate.

The Comitia still meet to accept the appointments of the senate.

[1] Vell. ii. 124.: "Primum principalium ejus operum fuit ordinatio comitiorum quam manu sua scriptam D. Augustus reliquerat." The pretexts assigned may be surmised from the further remarks this author makes on the subject (c. 126.): "revocata in forum fides; submota foro seditio, ambitio campo, discordia curiæ; sepultæque ac situ obsitæ justitia, æquitas, industria civitati redditæ."

[2] Thus although in *Ann.* i. 15. Tacitus had said that the Comitia were now transferred from the Campus to the Senate-house, in the eighty-first chapter of the same book he describes the action of the Comitia as still continuing: "De comitiis consularibus quæ tum primum illo principe ac deinceps fuere vix quidquam firmare ausim: . . . ." Comp. Dion, lviii. 20. I have stated in the text what appears to have been the ordinary arrangement; but this, it must be understood, was subject to occasional irregularities.

plain of the Campus Martius, continued to take place periodically to a much later period of the imperial history.[1] The candidates, already assured of their appointment, waited on the steps of the neighbouring temples while the auspices were taken and other tedious solemnities, which had long lost their significance, performed; and these were finally closed by the announcement of a herald that the election had fallen on the nominee of the emperor.[2] From henceforth, however, we are to consider not only that every consular appointment is made by the mere voice of the emperor, but that every other magistrate is chosen by the senate, partly on the imperial nomination, partly with a show of free selection, and, finally, that to these at least the popular sanction is also ostensibly given.[3] The effect of the reform, therefore, is after all not the transfer of any substantial power from the one assembly to the other, but simply an additional ray of pale and doubtful lustre cast on the laticlave of the senator.

II. The power of legislation.

II. The second function of the Comitia, that of legislation, stood on a somewhat different footing from that of election. The popular prerogative of choosing the officers of state had never been called in question throughout the career of the republic: it might be considered as absolutely in-

[1] The Comitia of the tribes under the empire met no longer in the forum, but in the Septa Julia of Agrippa in the Campus Martius. Dion, liii. 23.

[2] See the description of this ceremony in Pliny, *Paneg.* 63., and the passages from Suet. *Domit.* 10. and Senec. *Ep.* 118., which are brought to illustrate it.

[3] The practice of a later period, as described by Dion (lviii. 20.), was probably the same in substance as that of the Tiberian: *τῶν δὲ δὴ καὶ τὰς ἄλλας ἀρχὰς αἰτούντων ἐξελέγετο ὅσους ἤθελε, καὶ φῶς ἐς τὸ συνέδριον ἐσέπεμπε τοὺς μὲν συνιστὰς αὐτῷ, οἵπερ ὑπὸ πάντων ῥηροῦντο· τοὺς δὲ ἐπὶ τοῖς δικαιώμασι, καὶ ἐπὶ τῇ ὁμολογίᾳ, τῷ τε κλήρῳ ποιούμενος· καὶ μετὰ τοῦτο ἐς τε τὸν δῆμον καὶ ἐς τὸ πλῆθος* (the centuries and the tribes) *οἱ προσήκοντες αὐτῷ, τῆς ἀρχαίας ὁσίας ἕνεκα, καθάπερ καὶ πρίν ὥστε ἐν εἰκόνι δοκεῖν γίγνεσθαι, ἐσιόντες ἀπεδείκνυντο*

herent in the people and inalienable from them. Jealous of its own rights, and disposed to encroach upon all others, the senate notwithstanding had never ventured to claim a share in the appointment of magistrates who were to preside over the common weal. But the limits of the popular authority in the making of the laws, on the other hand, had been a constant subject of dispute between the two great powers of the state. Previous to the enactment of the famous Lex Hortensia, one of the great charters of the rights of the commons, the *Scita* of the Plebs were not binding on citizens generally until they had been ratified by the senate. The Comitia of the tribes were now rendered completely independent of the superior order: nevertheless it was some time before they asserted the powers thus secured to them in defiance of the senate, with which they had been long accustomed to co-operate harmoniously. The most flourishing period of the Roman free-state was that in which the two co-ordinate bodies were aware of their respective prerogatives, but each abstained from pressing them against the interests of the other. While the people were the real depositaries of legislative power, the senate enjoyed the right of nominating provincial governors, and through them of ruling the provinces: its decrees regarded the general administration of the empire, and these, as well as the appointments it made, were honourably respected by the assemblies of the commons. When, however, the Gracchi and their successors on the tribunitian benches thought fit violently to resent the advantages which the senate drew to itself from this division of government, the several prerogatives of the two orders, never accurately adjusted, were easily made to clash. The equilibrium of mutual forbearance once disturbed, it was impossible to restore the balance. Though the popular right of legislation was admitted, the senate

Independent legislation of the tribes balanced by the decrees of senate.

had many ways of thwarting, as well as of influencing it indirectly. The demagogues, to counteract this influence, resorted to the violent measure of requiring the assent of the senators to their most obnoxious propositions, under pain of judicial penalties.[1] This state of chronic hostility and defiance was only for a moment suspended by the reforms of Sulla, who compelled the tribes to submit the *Scita* to the ratification of their rivals the senate.[2] But the time had passed when the selfish and grasping measures of the senatorial body could be reconciled with the claims of the inferior order to its full share in the general government, and all Sulla's legislation fell with a crash together, under the pretended patronage of Crassus and Pompeius. Henceforth the legislative monopoly of the Comitia remained unquestioned: it was only subject to the indirect checks still left in the hands of the consuls and augurs. It was perhaps from their consciousness of the existence of these checks, however, that the leaders of the people generally contrived to secure the approval of a majority of the senate for their measures, and maintained to the last a show of concurrent legislation.[3]

Legislative power gradually assumed by the senate.

Nor had the senate indeed refrained, on its part, from encroaching on the legislative functions of its rivals, and snatching by various devices a substantive power of legislation for itself. It demanded that its *Consulta* should have the same independent force as the *Scita* of the Plebs. As far as regarded merely administrative regulations, there was nothing in this contrary to ancient and legitimate usage; the *Senatusconsultum Ultimum*, so often alluded to, by which the senate gave full powers to the consuls in cases of emergency, was only an extreme application of

[1] Appian, *Bell. Civ.* i. 29. [2] Appian, *Bell. Civ.* i. 59.
[3] See Dion, xxxvi. 7. 20., xxxviii. 7.; Appian, *Bell. Civ.* ii. 12.; Hoeck, *Röm. Gesch.* i. 3. p. 58.

its undoubted right to secure the efficiency of the executive in every act and movement. The senate pretended, however, still further to the right of annulling the resolutions of the comitia; and here again an extreme instance of its exercise has been more than once noticed, in the special release it accorded from certain laws, if not from the whole cycle of the laws of the commonwealth. To such encroachments the tribes were forced to submit whenever one of their tribunes had been gained by the opposite faction, an event of no uncommon occurrence; but no legitimate right could be established on a series, however long, of exceptional irregularities, against which the great body of the people had never failed to protest. Augustus, as the champion of the people, was careful to give full force to their legislative prerogative. Though he generally proposed his measures to the senate, and obtained its formal consent to the ordinances which emanated in fact from the small committee of its body which he took into intimate counsel, he seems to have always submitted them to the comitia of the centuries also, and obtained for his Julian legislation the sanction of every order of the state.[1] His long and busy reign sufficed to settle the principles of law; it remained for his successor rather to regulate the details of government, than reconstruct its essential forms. Hence Tiberius, averse by temper to the multiplication of legal enactments, had little occasion to call into play the full machinery of law-making. With the wider diffusion of the franchise the resident citizens of Rome ceased to represent the interests of the conquering race;

[1] Heineccius, *Antiq. Roman.* 1. tit. 2. 44. Projects of law which had been sanctioned by the senate were afterwards demanded (rogatæ) of the Comitia Centuriata, by which they were ratified as leges. But the Scita of the Comitia Tributa were made equivalent to leges by the lex Hortensia.

while the provincials were assuming more real importance in the eyes of the ruler, and the administration of the provinces, which had always been the function of the senate, became more and more coordinate with the general administration of the empire. Accordingly, without any ostensible reform, or the direct abolition of the popular prerogative, we find the power of making laws practically withdrawn, under Tiberius, from the comitia of the tribes. Two instances only are known of *Leges* passed in the regular course under his administration, while the *Consulta* of the senate are sufficiently numerous.[1] But the rights of the people in this respect were never formally annulled; and even through another century examples are cited of laws passed and ratified according to the usage of antiquity. The decrees of the senate, however, came, at least immediately after Tiberius, to be designated in many cases as laws, and to carry the full force of the more regular enactments.[2]

Transferred to the emperor's senatorial cabinet and hence to the emperor himself.

We have in this a second instance of the way in which an appearance of authority was given to the senate, which in fact was a mere idle show. The legislative powers of this assembly were restricted, just as the elective, by the real and substantial prerogative of the emperor, supreme alike over all. Much reliance,

[1] The lex Junia Norbana (Gai. i. 22., iii. 56.; Ulp. i. 10.) and the Lex Visellia (Ulp. iii. 5.; Hoeck, *Röm. Gesch.* i. 3. p. 59.). On the other hand, examples of senatusconsulta constantly occur in Tacitus and Dion. The whole series of the leges Juliæ is a monument of comitial legislation under Augustus.

[2] Thus Ulpian (early in the third century, A. D.) says, "Non ambigitur senatum jus facere posse." *Dig.* i. 3. § 9. Asconius had long before specified the cases in which the senate could control the legislative prerogative of the people: "Quatuor omnino genera sunt in quibus per senatum more majorum statuatur aliquid de legibus. Unum est ejusmodi, placere legem abrogari: alterum, quæ lex lata esse dicetur ea non videri populum teneri: tertium est de legum derogationibus." The fourth case, which Asconius omits, refers to the *legibus solvere*. Ascon. *in Cornel.* p. 67. ed. Orell. See Rein, *Criminal-Recht der Röm.* p. 62.

indeed, cannot be placed on the assertion of Dion that the senate formally invited Augustus to make what proposals he pleased, and proposed even to bind itself by an oath beforehand to accept them as laws; for in the beginning of the empire the senate could hardly have assumed any such power of dispensing with the concurrence of the popular assembly.[1] That it obsequiously placed its own suffrage at his disposal is credible enough; but even this is to be understood of an extraordinary and momentary abdication of its proper responsibility. Nor in fact did Augustus himself definitively accept it. When, however, he chose himself a cabinet, consisting of a select number of senators, including the consuls and princes of his own family, to confer with on affairs of state, the senate did undoubtedly transfer all its proper functions to this body, which was in fact a standing committee of its own order, and was considered to represent the wisdom of the whole. The measures which had been discussed and adopted by this conclave were still promulgated before the entire assembly, by which they were accepted with acclamation, and through this channel the prince of the senate acquired unlimited power of legislation. Tiberius, it seems, did not retain this select council. His measures emanated from his own breast alone, except when he chose to take a private counsellor, such as Sejanus, into his confidence. He convened the fathers to listen to an address from his own mouth, in which he explained the scope of his plans, and proposed them for the assembly's consideration; or he put up some private member to make the proposition when he chose to disguise his own inclinations. He introduced also the custom of sending a written despatch to be read to the assembly in his absence, in which his views on any project of law, pro-

[1] Dion, liv. 10.

posed by himself or by another, were declared or insinuated.[1] But in all these cases the senate was regarded as competent to discuss and amend, and even, if it had the courage, to reject, though the latter alternative may have never been actually assumed. Many instances, however, are recorded of individual senators arguing upon the imperial proposition, and even condemning it, and, at least at the commencement of the Tiberian principate, it was deemed a refinement of flattery to affect such freedom of discussion. This, perhaps, is the limit to which the imperial authority extended in the matter of legislation at this period: it was practically complete, but in outward show reached only to recommendation. It must be understood, however, that the senate, in its proneness to adulation, was constantly representing itself as the devoted slave of the prince, and the mere registrar of his decrees; accepting, in short, the practice as if it were the law of the time, and satisfying its own pride and dignity by a mental reservation, to the effect that its concession to its chief was a mere voluntary cession of its undoubted prerogatives, which it might at any time resume, and which, in fact, on the death of each emperor, reverted *ipso facto* to itself, to be ceded to his successor or withheld from him at its own proper pleasure.[2]

III. The criminal jurisdiction of the people and of the senate.

III. In regard to criminal jurisdiction the loss of the popular assemblies was still more complete and signal, while the senate, at least in outward appearance, gained all that the people had lost. From early times there

[1] The epistola or libellus of the princeps was recited by one of the quæstors, who was called his candidatus. *Digest.* i. 13. § 4.: "Ex quæstoribus quidam sunt qui candidati Principis dicuntur, quique epistolas ejus in senatu legunt."

[2] It was not, I think, till the time of the Antonines, as we shall see hereafter, that the Oratio or Rescriptum of the emperor was referred to in the same terms as a Lex. Comp. *Digest.* xxiii. 2. §§ 57, 58. 60.

had been a certain rivalry between the two powers in respect to jurisdiction, and the mutual limit of their prerogatives on this point was not strictly defined. The people in their centuries,—the assembly in which wealth and station were most fully represented, and not merely numbers, as in the tribes,—claimed the ultimate right of deciding on the citizen's *caput*, that is, his civil status, and, at least in political cases, it was before this assembly that the chief magistrates were required to summon offenders. But, on the one hand, the comitia of the tribes encroached gradually on this prerogative; on the other, the senate claimed exclusive jurisdiction over the acts of the citizens in the provinces, and, by some irregular and unexplained usurpation, sometimes within the bounds of Italy also.[1] The last remnant of the supreme power originally inherent in the people, was the right of appeal to it, which was always possessed by the criminal in capital cases; though even here too the senate presumed to evade the principle of the law, by declaring in extreme cases the state in danger, and thrusting extraordinary powers into the hands of the consuls. Thus the accomplices of Catilina were brought to trial before the senate, condemned, and executed without appeal, much to their own astonishment at the vigour of the proceeding, and not without great offence to the people, or at least to their leaders. But throughout the last century of the free state the jurisdiction both of the comitia and the senate was almost completely over-ridden by the institution of the *Quæstiones perpetuæ*, the permanent or fixed tribunals, and the old contest between the two poli-

Overridden by the fixed tribunals.

[1] This jurisdiction of the senate in the provinces was a part of its administrative competence therein through its officers. Polybius asserts that in his time it had jurisdiction also within the bounds of Italy in cases of treason, conspiracy, and murder. Polyb. vi. 13.; Hoeck, i. 3. p. 63.

tical bodies of the commonwealth was exchanged for a competition among its leading classes for admission to these tribunals, or a preponderance in them.

The appeal transferred from the people to the emperor.

The appeal to the people was tacitly extinguished by Augustus, who reserved the right of judgment in the last resort to himself alone, in virtue perhaps of his tribunitian power, by which he was the constituted guardian, and in some sense the vicegerent of the tribes.[1] But both he and still more his next successor invited the senate to take cognisance of many offences which had hitherto been subjected to the jurisdiction of the fixed tribunals. Mæcenas, we are told, advised that all charges against senators, their wives and children, should be referred to the senate alone; and it has been supposed, no doubt too hastily, that the counsels popularly ascribed to this minister indicate the actual course pursued by his master.[2] In this case, however, it would be too much to affirm that either the first or the second princeps actually transferred from the tribunals to the senate the cognisance of all charges against members of its own body. In Piso's process, for instance, though the culprit was himself a senator, the prosecutors commence their proceedings by invoking the emperor to investigate the affair in person, and he declines the task as inconvenient rather than irregular. He goes on to say in his reply that, in remitting the affair to the judgment of

Cognisance of charges against senators.

[1] The comitia of the centuries, as has been before remarked, represented the Roman people in their military character, and, therefore, were held, not in the Forum, but beyond the walls: the distinctive meaning and rights of this assembly became extinguished as the citizens ceased to constitute the military force of the republic.

[2] Dion, lii. 31. Hoeck relies on this passage as if it were an express statement of the law or practice under Augustus. It is, however, pretty well understood, as I have elsewhere remarked, that the counsels the historian puts into the mouth of Mæcenas represent more correctly the usage of his own time, *i.e.* the third century.

the senate, he evinces his regard to the rank of Germanicus; for in a less conspicuous case the appointed tribunal for murders would have been fully competent to undertake the process.[1] It would appear, however, that the Quæstiones, though still existing, were gradually degraded from the high position they held under the republic. The senate received jurisdiction in cases not only of *Majestas* and *Repetundæ*, that is, of Treason and Extortion, but of Murder, Poisoning, Bribery, and others: and this was not confined perhaps to charges against members of its own order. A less invidious and at the same time a more brilliant prerogative of this body, however, was that of deciding upon the offences of allies and dependent sovereigns against the interests of the Roman state and its chief. This was a function which the assembly had claimed from an early period, as the executive of the Roman people abroad; nor had it ever been wrested from the senate by the comitia, nor transferred to any special tribunal. On the whole, the senate, from the time of the Tiberian principate, may be described as a high Court of Criminal Jurisdiction of the most comprehensive kind.

The senate under the empire becomes the chief court of criminal jurisdiction.

The Romans, consistently with their inveterate jealousy of all that savoured of monarchical authority, refused to assign the highest judicial competence to any single judge; and when the unwieldy proportions and gross unfairness of such a tribunal as that of the people themselves, assembled in their comitia, became no

Paramount jurisdiction of the emperor himself.

[1] Tac. *Ann.* iii. 12.: "Id solum Germanico super leges præstiterimus, quod in curia potius quam in foro, apud senatum quam apud judices, de morte ejus anquiritur." An ordinary case of murder would have been tried by the quæstores homicidii in a basilica adjoining the Forum. The quæstiones perpetuæ were, by legal fiction, committees of the tribes, and the basilicas were the committee-rooms of the Forum, their place of assembly.

longer tolerable, they invented, in the Quæstiones Perpetuæ, a sort of virtual representation of themselves by standing committees. The number of members of each of these boards might vary from three or four to twenty or thirty, or even more. Charges of inferior gravity were referred to a commission, consisting nominally of a hundred members, but sometimes in reality much exceeding that number. The vital principle of the most perfect systems of modern procedure, which secures the responsibility of the judge by isolating him from the rest of the community, and bringing public opinion to bear on him from the eminence of his character and position, was abhorrent from the democratical spirit of the Romans, and the fixed idea of their polity, that truth was to be found in the decisions of a majority. These views, however, were irreconcileable with the principles of monarchy; and the emperor had, in fact, no alternative, but either to appoint special judges of eminence enough to make their decisions respected, or to become himself the controller of the decisions of a more numerous and less responsible body. From the moment that judicial competence was spread over a body of six hundred members, the concentration of actual jurisdiction in the hands of their chief became inevitable. It is of little consequence, therefore, to inquire from which of his special functions the princeps might most logically derive the judicial prerogative which was soon found to attach to him; whether it proceeded from the sovereignty of the people lodged virtually in his person; whether from the military autocracy of the imperium; or whether from the combination of the consular, the proconsular, and the tribunitian powers, each of which undoubtedly conferred jurisdiction in particular cases. Of the first of these hypotheses, it may be remarked that the sovereignty of the people was certainly not

at this period directly and legitimately transferred to the emperor[1]; of the second, that the judicial functions of the imperator were restricted to the camp[2]; and of the last, that the jurisdiction of the three magistracies above named was in each case specifically limited; nor would the combination of all together extend so far as to cover that claimed and exercised by the emperor, which was, indeed, practically unlimited. It may be admitted, however, that it was the jurisdiction of the emperor in these several capacities that gave him his ground of vantage for consolidating his more sweeping pretensions. In proportion as these powers themselves became more extensive, so did the judicial qualification they imparted become less strictly defined. The imperial prerogative of Pardon was an extension or distortion of the tribunitian right of Succour: that of revising or annulling the decrees of the senate was an exaggeration of the privilege of Intercession; and we can imagine how, when the emperor was thus raised above all legitimate principle and usage, both accused and accusers might combine to cast themselves at the foot of the throne, and solicit the arbitration of a judge from whose preeminence they might expect impartiality. The Romans, it must always be remembered, were to the full as impatient

[1] Even at a much later period the basis of the imperial power assumed by Ulpian, after Gaius, is of course a mere legal fiction: "Quod populus ei et in eum omnem suam potestatem conferat."

[2] Dion affirms (liii. 17.) that the emperor derived from his imperium the right of putting senators and knights to death within the city. This is one of many passages of this writer of the third century in which he puts the admitted usage of his own day on the footing of earlier and legitimate principles. The practice employed, as we shall see, by Tiberius himself, in the latter part of his reign, was a mere usurpation of the sword, and bore no constitutional sanction. It was precisely for such usurpations as this that the acts of certain of the emperors were formally rescinded by the senate after their deaths.

in thrusting irregular powers upon their ruler as he was in usurping them.[1] From the combination of both these impulses, the jurisdiction of the senate had become, before the death of the second princeps, entirely dependent on his direction; and whenever his interests were at stake, the judicial sentence of the fathers was no other than the expression of his will inspired by himself. In the same way, moreover, the decisions which he pronounced with his own mouth were generally merely the echoes of his private pleasure.[2] Accordingly, except in certain outward show, and the popular estimation thereto attaching, the senate derived little or no advantage from its apparent triumph over the people in the matter of jurisdiction. In this as in other respects it was the mere passive instrument of the emperor's will, and its character became insensibly degraded by the consciousness that all its magnificent pretensions were no better than empty shadows. With a set of high-sounding formulas ever in its mouth, it was, in fact, only blowing bubbles for the amusement of a frivolous populace.

Supremacy of the emperor in election, legislation, and jurisdiction.

Such was the process by which the three sovereign rights of the Roman people were gradually taken from them and transferred in name to the rival body of the senate, but in fact to the emperor himself. Henceforth it depended on the personal character of the chief whether the government of Rome assumed or not the appearance of that autocratic despotism which it really was, however the fact might be disguised. As regarded

[1] Hence the memorable expression ascribed to Tiberius himself, with regard to the Roman people: "O homines ad servitutem paratos." The sentiment was no doubt commonly in men's mouths. So Cæsar in Lucan: "Detrahimus dominos urbi servire paratæ." *Phars.* i. 351.

[2] See Hoeck, i. 3. 68.; citing Suet. *Tib.* 60. 62.; Tac. *Ann.* iii. 70.

the right of jurisdiction, Tiberius continued for the most part to maintain the principle of administration which he had asserted from the first, that of using the senate as the ostensible instrument of his government. He refrained generally, as in Piso's process, from assuming judicial powers himself, and referred all suitors for his decision to the great assembly of the state. This moderation sufficed to satisfy the mass of his subjects. The reform of the rights of election caused but a slight murmur among the people from whom they were finally withdrawn[1]; the abolition of their legislative and judicial competence was accepted without a sign of mortification. The populace of Rome had bidden farewell to all its political interests, and it is only from their connexion with politics that the rights of legislation and jurisdiction are ever interesting to the great body of a nation. The senate itself was flattered by the appearance of a victory over the rivals with whom it had waged such long and dubious warfare. It might amuse itself with the idea that it had found compensation for the disasters of Pharsalia and Philippi, and that the chiefs who had been borne to power on the shoulders of the popular party had been compelled, even in the moment of their elevation, to negotiate the support of the power which they had worsted in the field. But the princeps had in fact got the senate completely under his influence. The powers of the censure alone, the highest and most venerable perhaps of any functions of administration, gave him, under the fairest disguise, a direct means of controlling it. The sum of twelve hundred thousand sesterces being fixed as the qualification for a place in the assembly, the emperor encouraged men of birth,

The emperor's control over the senate through the powers of the censorship.

[1] Tac. *Ann.* i. 15.: "Neque populus ademptum jus questus est nisi inani rumore."

whose fortunes had fallen below this standard, to apply to him for an increase of means; at the same time he took care to let them feel, by an occasional repulse, accompanied with harsh observations, how mere a matter of favour such an indulgence would be. After aiding, as it was styled, the census of several of the body, his rejection of the petition of a pauper senator named Hortalus, a grandson of the illustrious Hortensius, caused considerable dismay. How the wealth accumulated by that busy advocate had been dissipated, does not appear; but already under the principate of Augustus Hortalus had received a pecuniary gratification, to enable him to marry and rear a family, and maintain the honours of his historic house. Still, however, was he haunted by the demon of poverty. Rising in his place in the senate-house, at the open doors of which he had stationed his four sons, and turning himself on the one hand to the bust of Hortensius, conspicuous among the images which adorned the hall, on the other to that of Augustus, he addressed a speech to Tiberius, entreating him in the names of both to afford him the succour he required. But whether from a settled policy of degrading the representative of a great republican name, or from personal dislike, or, as Tacitus insinuates, merely from a spirit of surly opposition to the inclination of the senators around him, Tiberius not only rejected the application, but rebuked it as presumptuous and importunate. *The divine Augustus,* he said, *gave you money spontaneously, without solicitation, nor did he mean to bind himself or me to repeat the same liberality on all occasions.* He consented, however, to gratify the senate by making a trifling present to the children; after which he made no further effort to save the rapid decline and degradation of their house.[1]

Petition of a pauper senator.

[1] Tac. *Ann.* ii. 37, 38.

This control over the senate was still further assured by the right of its princeps to convene it at his own pleasure on extraordinary occasions, as well as to prorogue its ordinary sittings. If he could not legitimately require it to affirm every proposition he placed before it, he was enabled at least to defeat at once any motion that was disagreeable to himself, either by dissolving the assembly, or even by putting his veto upon the transaction. The utmost liberty it continued to possess extended not to acts, but merely to language, if the indistinct murmurs and interjectional sarcasms which were occasionally heard within its walls could be dignified with such an appellation. But every such indication of independent opinion, however disguised and smothered, was watched with a jealousy which the substance of power never allowed to slumber, and the law of Majestas or Treason, which Tiberius brandished over the heads of his counsellors, was an instrument of flexible and searching application for unveiling their hidden sentiments, no less than for controlling their conduct.

The emperor's control over the senate by the law of Majestas.

Majestas, according to the Ovidian apologue, was the daughter of Dignity and Respect, who first after the dispersion of primeval chaos taught the rules of courtesy to the rude and undisciplined divinities.[1] Ages rolled away, and when the Giants rose in arms to restore universal anarchy, Jove overthrew them with his bolts, and defended the majesty of the gods, never again to be presumptuously assailed. Hence, she ever sits beside him; she cherishes and protects him; the awe inspired by her influence makes his sceptre to be

Origin of the law of Majestas.

[1] Ovid, *Fast.* v. 23.:

"Donec Honos placidoque decens Reverentia vultu
Corpora legitimis imposuere toris."

Honos and Reverentia are correlatives: the one is the honourable station or office, the other the respect due to it.

obeyed without force of arms. She has descended also upon the earth. Romulus and Numa acknowledged and adored her; nor less did their successors, each in his own generation. She it is that makes our fathers and mothers to be respected; she attends upon our youths; she protects our virgins; she commends to the consul his fasces and ivory chair; finally, she rides aloft on the laurelled chariot of the imperator.[1] Such was the language by which a flatterer of Augustus might divert the imagination of his countrymen from the idea of the abstract majesty of law and constitutional principle, to that of the glory which surrounded the person of the ruler; from the recollection of kings and consuls to the contemplation of the emperor himself, over whom all the ensigns of office were suspended. Under the empire the law of majesty was the legal protection thrown round the person of the chief of the state: any attempt against the dignity or safety of the community became an attack on its glorified representative. Nevertheless, it is remarkable that the first legal enactment which received this title, half a century before the foundation of the empire, was actually devised for the protection, not of the state itself, but of a personage dear to the state, namely, the tribune of the people. Treason to the state indeed had long before been known, and defined as *Perduellio*, the levying of war against the commonwealth. Laws on this subject had existed from the time of the kings.

The lex Apuleia, A. U. 654.

But the crime of majesty was first specified by the demagogue Apuleius, in an enactment of the year 654, for the purpose of guarding or exalting the dignity of the champion of the plebs. Any attempt against the prerogatives of this popular officer was declared to be an assault on

[1] Ovid, *l. c.*:

"Illa datos fasces commendat, eburque curule;
Illa coronatis alta triumphat equis."

the greatness and dignity of the commonwealth itself: to detract from the majesty of the tribune was an offence which the new law smote with the penalties of treason.[1]

The law of Apuleius was followed by that of another tribune, Varius, conceived in a similar spirit. But it was the object of Sulla, in the ample and methodized scope of his Cornelian constitution, to withdraw the definition of majesty from a mere offence against public officers, to attempts on the general interests of the commonwealth. The dictator conceived and embodied, in the spirit of a proud republican, the noble sentiment of a patriot of our own, that *There is on earth a far diviner thing, Veiled though it be, than parliament or king.* He recalled men's minds from the vulgar personifications to which democracy naturally inclines, to the higher abstractions of an enlightened political wisdom. The distinction between Majestas and Perduellio henceforth vanishes: the crime of Treason is specifically extended from acts of violence to measures calculated to bring the state into contempt. It is made to include not only acts of commission, but many cases of the neglect or imperfect performance of duty.[2] It is now majestas in

The lex Varia: the lex Cornelia.

[1] Among the numerous treatises upon this subject I have particularly referred to some chapters in the work of Rein, on the Criminal Law of the Romans. He assigns the date of the lex Apuleia to 654 U. C., not 652. The personal application of the law appears in a passage of Cicero (*De Invent.* ii. 17.): "Majestatem minuisti quod tribunum pl. de templo deduxisti;" but the more general definition of the crime is given in the *Ad Herenn.* ii. 12.: "Majestatem is minuit, qui ea tollit, ex quibus civitatis amplitudo constat." Again, the two branches of the crime are combined in one view (*De Invent.* ii. 17.): "Majestatem minuere est, de dignitate, aut amplitudine, aut potestate populi, aut eorum quibus populus potestatem dedit, aliquid derogare:" or once more, "Aliquid de re publica, quum potestatem non habeas, administrare." Rein, *Crim-Recht der Römer*, p. 509.

[2] Thus, on the words of Cicero against Verres (2 *Verr.* i. 33.), "Quid immisisti jus legationis," the Pseudo-Asconius remarks

a public officer, not only if he wages war without due authority from the state, or betrays his trust to the enemy, or foments sedition among the citizens or mutiny among the soldiers; but if he shrinks from asserting to the full the prerogative of his office, whether military or civil, or forbears to deliver his prisoners to the proper authorities for punishment or ransom.[1] To remove or overthrow a monument of the glory of the commonwealth, such as a statue or a trophy, might afford ground for a charge of this nature, as wounding the pride of the nation or touching its honour.[2]

The motive for Cæsar's legislation on the subject of majestas, in which he went further into details than Sulla, but in no respect diverged from his principles, was no other perhaps than a determination to obliterate every monument of the usurpation of the senate, and its redoubted dictator. Cæsar was the hereditary antagonist of Sulla, and, to complete the full cycle of his rivalry, it was necessary that he should emulate his predecessor in legislation as well as in arms and administration. The chief provisions of the lex Julia on this subject have been preserved to us by the jurists of the later empire; but we are not perhaps quite competent to decide how far the law, as it came from Julius himself, was modified by his next successors. It is still a disputed point whether Augustus promulgated any distinct lex Julia of his own upon Majestas; though there is no question that in some respects he ex-

The lex Julia de Majestate.

(Orell. p. 182.): "Qui potestatem suam in administrando non defenderit, imminuti magistratus veluti majestatis læsæ reus est."

[1] Cæsar's juvenile act of audacity in punishing his captive pirates, and refusing to deliver them to his superior officer, was a defiance of the Cornelian law of Majestas. See vol. i., ch. iii.

[2] This is one of the charges Cicero brings against Verres (2 *Verr.* iv. 41.), of which he affirms, "Est majestatis quod imperii nostri gloriæ rerumque publicarum monumenta evertere atque asportare ausus est."

tended the law of his predecessor, including in his definition the publication of written pasquinades against the emperor, as an indirect mode of bringing the person of the ruler into contempt, and smoothing the way for disaffection and resistance. This is perhaps the only trace of any desire on the part of the two first emperors to give the law a special application for their own protection; and even in the Cornelian law some provision seems to have been made to check the licence of railing against the constituted authorities.[1]

Provisions of the Julian Law of Majesty.

It will be important for the just appreciation of later usage in respect to this grave offence, the highest, except sacrilege, known to the Roman law, to place before our eyes a comprehensive sketch of the Julian enactments regarding it. Majestas, then, was defined to be injury to the state:—1., in respect of its public enemies, as by the surrender of cities or persons, the abetting or assisting them in their enterprises, desertion to them, cowardice in action against them, and the like: 2., in respect of its internal constitution, as by illicit combinations, clubs, and conspiracies, or more openly by sedition and riot: 3., in respect of its officers, as when one magistrate encroached on the functions of another, or withheld from his successor the forces of his province, or released a criminal from punishment, or made war without public authority; or, again, where one compassed the death of a public officer, or wrested from him his prerogatives: 4., from the falsification of the public documents.—It was necessary to the establishment of the crime to prove the criminal intention; but the attempt was held to be equally obnoxious to the law as the act itself, and the accomplice by aid or counsel was

[1] Cic. *ad Div.* iii. 11.: "Et si Sulla voluit ne in quemvis impune declamare liceret."

amenable to the same punishment as the principal.[1] This punishment was simple and uniform. It consisted in the interdiction of fire and water, which was practically equivalent to banishment, and was attended with confiscation of property, being the same penalty which attached to the more ancient crime of perduellio.[2] The trial of charges of this kind was regularly reserved for one of the special tribunals. During the brief period of Cæsar's power it does not appear that this tribunal was ever called into action. Trials for majesty were few even under the long principate of his successor. Augustus carefully abstained from the employment of an engine which he well knew must, from the nature of things, tend to fix in men's minds a sharp distinction between the chief of the state and the state itself. The sacredness which attached to the tribunitian office, now vested in himself, could not fail to raise the person of the ruler above the abstract ideas of constitutional principle; but he was anxious not to hasten the moment when the people of Rome should regard the law of treason merely as a device for their ruler's security. He felt himself protected by other and stronger safeguards; while the chief danger of his position actually lay in the risk of his disguise being torn too rudely from him.

Reserve of Augustus in its application.

It has been already shown how the natural policy of Tiberius pointed in another direction. The second princeps required special guarantees for his security. Accordingly from the very commencement of his reign

Under Tiberius protection demanded for the person of the emperor.

[1] See Rein (*Criminal-Recht*, pp. 518—528.), chiefly from the writings of the jurists. Tacitus (*Ann.* i. 72.) states the principle of the law: "Si quis proditione exercitum aut plebem seditionibus, denique male gesta re publica majestatem populi Romani minuisset: facta arguebantur, dicta impune erant."

[2] Tac. *Ann.* iii. 50.: "Bonis amissis aqua et igni arceatur: quod perinde censeo ac si lege majestatis teneretur." Comp. iii. 38. 68., iv. 42.; Paulus, v. 29. 1.

we mark a change in popular opinion, which he fostered and encouraged. The person of the emperor begins now to be the great subject of the law of treason: though not formally so pronounced, the idea that the emperor is himself the state begins to predominate in the national feeling over every other. The emperor is now in the world what the gods are in Olympus, a being to be reverenced and feared simply for himself, without regard to his attributes, or the qualities he may be supposed to embody. Attempts on his life become heinous deeds, only to be compared with sacrilege against the blessed divinities. Not only such overt acts, however, but any conduct or language which could be construed into the compassing of his death, became involved in the crime and penalties of treason. Rome was full of soothsayers or magicians, who pretended, by casting horoscopes or evoking dead men's spirits, to communicate a knowledge of future events. By playing on the credulous cupidity of heirs or fortune-hunters, these impostors acquired wealth and consideration. In the age of Catullus, a wicked parent might *wish* for the death of his son, or the son disclaim all sorrow for the loss of his parent: but in the next generation Ovid could represent the guilty spendthrift as *inquiring into the years* of the sire who stands between himself and fortune.[1] To inquire thus into the years of the emperor, to explore, that is, the secret of his destined term of life, was now reputed treasonable: there must be, it was argued, some stronger motive for such an inquiry than mere indecent curiosity: the man who sought to ascertain beforehand the day of the emperor's

[1] Compare, among the signs of human degeneracy in Catullus, liv. 401.:

"Destitit extinctos natus lugere parentes:
Optavit genitor primævi funera nati . . . ."

with Ovid, *Metam.* i. 148.:

"Filius ante diem patrios inquirit in annos."

doom must have some illicit interest in the dire event; he must cherish the hopes of a traitor in his heart.[1] Not only pasquinades and injurious publications of every kind directed against the emperor were now comprehended in the qualification of majestas, but also abusive and insulting language, which Augustus had so magnanimously tolerated. The two first Cæsars, and generally the best and wisest of their successors, allowed ample licence to the tongue, in the freedom of which the Romans continued to demand indulgence long after they had surrendered all independence of action.[2] This licence of language was fostered by the manner of their education. We have seen how they were brought up from childhood as gladiators in the arena of debate and declamation: fence of tongue was the weapon with which they were to maintain against every assailant their honour, their fortunes, and their lives. Readiness of speech and ease in the handling of the weapons of retort and sarcasm were carried from the schools of rhetoric to the tribunals or the forum, and again from the places of their public exercise to the private assembly or banquet. Scurrility of language was indeed characteristic of the Italians, and was

Licence of language in use among the Romans.

[1] Paulus, v. 21. 3.: "Qui de salute principis vel de summa reipublicæ mathematicos . . . . consulit, cum eo qui responderit capite punitur." Tertull. *Apol.* 35.: "Cui opus est perscrutari super Cæsaris salute, nisi a quo aliquid adversus illum cogitatur vel optatur aut post illum speratur et sustinetur?"

[2] The laws of the twelve tables had specified defamatory writings, or publication generally, as one kind of Injuria; but the excessive severity of the penalty, which was no less than death, seems to show that the crime was not practically visited at all. The disuse of this process gave occasion for the prætors to issue notices against libel in their edicts, and one or two cases occur, under the free state, of actions for slander, for satirical writings, or misrepresentations on the stage. Fines and civil infamy were the penalties now attached to this offence. Sulla, and after him Augustus, legislated specifically upon the subject of the famosi libelli: confining themselves, however, to writings only, and allowing full licence to merely oral abuse. For the proceedings of Augustus, see Suet. *Oct.* 51.; Tac. *Ann.* i. 72. See this subject fully discussed by Rein, pp. 354—385.

common to all classes: it extended from the senators and knights to the lowest of the populace; it startled alike the decorum of patrician nuptials and enlivened the humours of the Saturnalia. The coarse ribaldry of the Fescennine farces embodied the same spirit of unbounded personality which glows in the polished sentences of Cicero, or flashes from the point of an epigram of Catullus. According to Roman habits of thought, and agreeably perhaps to the theory of the Roman polity, the private life and habits of the citizen were as much the property of his fellow-countrymen as his conduct in public affairs. His domestic vices were charged as crimes against society, and an accusation of bribery or extortion was habitually introduced by a pretended exposure of sins of lewdness or intemperance. This licence of defamation was the birthright of the free Roman, of which he was often more jealous than of his independence in thought and action. He might subject himself to the arbitrary authority of a tribune or a dictator without a murmur, as long as he was permitted to retort upon them with jests and scandalous anecdotes. No government could maintain itself on the basis of popular opinion without repressing these extravagant excesses. When the chief of the state was raised to an eminence from which he could not descend into the arena of personal controversy, it became a necessary act of policy to restrain the licence of attack by measures of adequate severity.[1]

Conduct of Augustus and Tiberius with respect to injurious language.

Two accounts are given us of the provocation which induced Augustus to extend or restore the laws against defamatory writings. On the one hand, we are told that he was offended by the licentiousness of a writer named

[1] On one occasion Augustus threatened to retort: "Faciam sciat Ælianus et me linguam habere; plura enim de eo loquar:" but he abstained nevertheless from committing himself to the unequal encounter. Suet. *Oct.* 51.

Cassius Severus, who lashed the most illustrious of the citizens of both sexes indiscriminately.[1] We may infer, therefore, from this statement, that the emperor now afforded the protection of the law to women as well as to men, which was probably a novelty; at least, the principle of the original laws of libel was founded on the civil dignity of the citizen, to which a woman could lay no claim.[2] On the other hand, it is stated that he was moved to this course by an attack made on himself by Junius Novatus, a partisan of the unfortunate Agrippa. If this be true, the confirmation of the law must have been among the latest acts of the aged emperor's reign.[3] In either case, it does not appear that the first princeps gave himself any other protection in this particular than what he allowed to every citizen. As regarded himself, he is said to have been very mild in prosecuting or punishing this offence, and to have refused to inquire at all into mere oral invectives.[4] Very different, however, was the conduct in this respect of his uneasy successor. The awkward and ungenial manners of Tiberius had been an early subject of ill-natured remark: he was already accused of gross intemperance, against which many pungent epigrams were directed.[5] But as he rose in eminence

[1] Tac. *Ann.* i. 72.: "Commotus Cassii Severi libidine qui viros feminasque illustres procacibus scriptis diffamaverat."

[2] Injuria was anything which unfavourably affected the public estimation of a citizen, and consequently his power of serving the state. But Augustus treated Defamation not as Injuria, but as Majestas, the greater scope of which enabled him to throw the shield of the law over illustrious women also.

[3] Suet. *Oct. l. c.*

[4] Suet. *Oct.* 55. He contented himself, according to this writer, with contradicting by proclamation some of these attacks, and forbade the senate to prohibit by a decree the introduction of posthumous abuse of the emperor in wills. But Dion (lvi. 27.) says that he caused some libels against him to be burnt, and punished the writers.

[5] Suet. *Tib.* 42. The supposed fragment quoted by Burmann is in fact this passage of Suetonius versified:

and power, the attacks on him assumed a more serious form, impugning his character as a ruler, imputing to him cruelty beyond the law, and a pride indecent even in the first of the citizens. The free insinuation of disagreement between the prince and his mother might lead to inconvenient revelations of his domestic privacy.[1] When on his first accession to power his pleasure was taken by the prætor about the appointment of the special commission for Majestas, he evaded the question with a general reply. He did not intend to allow these cases to fall under the jurisdiction of an independent tribunal, but to reserve them for the cognisance of his own instrument, the senate; or perhaps at this time he had not really determined what course he should pursue. At first he met such accusations with a magnanimity worthy of a great monarch: *Let them hate me*, he was heard to say, *as long as in their hearts they respect me; .... in a free state*, he added, *both mind and tongue should be free:* but unfortunately he could not maintain this elevation of sentiment, and the bitterness with which he presently revenged himself on his detractors was supposed to prove that the charges

"Exinde plebs Quiritium vocavit
Non Claudium Tiberium Neronem
Sed Caldium Biberium Meronem."

Comp. Suet. *Tib.* 59.:

"Fastidit vinum quia jam sitit iste cruorem;
Tam bibit hunc avide quam bibit ante merum."

[1] Tac. *Ann.* i. 72.: "Hunc quoque asperavere carmina, incertis auctoribus vulgata, in sævitiam superbiamque ejus, et discordem cum matre animum." We may conceive the effect on prince and people of such an epigram as the following placarded on the walls of a modern European capital: Suet. *l. c.*:

"Aspice felicem sibi non tibi, Romule, Sullam:
Et Marium si vis aspice, sed reducem:
Nec non Antoni civilia bella moventis,
Nec semel infectas aspice cæde manus:
Et dic, Roma perit: regnabit sanguine multo
Ad regnum quisquis venit ab exsilio."

against him were pointed with the fatal sting of truth.[1]

Crime of Majesty extended from writings to words.

When, however, it once became known that the new princeps was jealous of his estimation in the minds of the citizens, and would not suffer himself or his position to be disparaged by railing defamation, there were many to urge him forwards, and impel him beyond the bounds he may have originally prescribed to himself. It was impossible to maintain any clear distinction between the guilt of written and merely spoken libels. It might be said, indeed, that the one admitted of direct proof, while the other could only be prosecuted on the precarious ground of hearsay evidence; or that the one argued deliberate intention, the other might be a momentary ebullition of thoughtless spleen; or, lastly, that the one was a crime recognised by the ancient laws, the other was not less expressly countenanced by them as a privilege of the Roman freeman. But all these considerations gave way, and not unjustly, to the conviction that the malice might be the same, the injury equal in either case, and that common sense and equity demanded that they should both be brought under the same category of crime. Tiberius was encouraged, not by courtiers only, but by jurists and philosophers, in extending the definition of majesty from writings to words; and in so doing, he only carried out a sound and reasonable principle. But this was not all. It was easy to see that there might be many other ways of bringing the person of the sovereign into contempt, besides either writings or words. The same jurists who could not blind themselves to the logical sequence from one of these to the other, were at a loss

[1] Suet. *Tib.* 42.: "Oderint dum probent: dein vera ceptaque esse ipse fecit fidem." 28.: "In civitate libera linguam mentemque liberas esse debere."

to distinguish from them a variety of actions, some monstrous and many merely ridiculous. Thus Falanius, a knight of obscure position, was accused of disrespect to the princeps, amounting to the guilt of treason, inasmuch as he had admitted a low and profligate actor to assist in celebrating the rites of the deified Augustus. Another of the same class, named Rubrius, was charged with having forsworn himself in the name of that illustrious divinity, and again, of allowing, at the sale of a villa, the sacred image to be sold along with it. It was pretended that disrespect towards the deceased Cæsar was an injury to his living successor. But Tiberius refused to subscribe to this doctrine. He wrote a letter to the consuls in favour of the accused, asserting that Livia herself, in exhibiting games in her husband's honour, had not deemed it requisite to inquire into the life and manners of all the professional people she employed; adding that perjury in the name of Augustus was no more a subject for human laws than the violation of an oath to Jupiter; and ending with the memorable aphorism, profane perhaps in the mouth of any one not himself next of kin to divinity, that the gods should be left to mind their own honour.[1] About the same time a man of higher rank and character, named Granius Marcellus, apparently a connexion of the imperial house, then prætor of Bithynia, was accused by an officer of his own staff of having uttered in conversation some reflections on the emperor's personal habits; a charge which, we are assured, it was impossible to refute, so strong was the presumption against any man of having remarked on the profligacy which was notorious to all the world.

Constructive majesty. Case of Falanius and Rubrius. A. D. 15. A. U. 768.

Case of Granius Marcellus.

[1] Tac. *Ann.* i. 73.: "Jusjurandum perinde æstimandum quam si Jovem fefellisset Deorum injuriæ Dis curæ."

But a more specific charge against the prætor was that of having placed his own effigy in a higher and more conspicuous place than those of the Cæsars, which, as remotely connected with his family, adorned the hall of his mansion: it was even suggested, as an impious flattery at which the emperor's modesty would revolt, that he had removed the head from an image of Augustus, and replaced it with that of his living successor. In this case also Tiberius rebuked the officious zeal of the prosecutor. The culprit was acquitted of the charge of treason; but he happened to lie at the time under a charge of extortion in his province, and on this the senate was permitted to condemn him.[1]

Case of Lutorius Priscus.

But of all the charges of this nature now preferred, none was more extravagant than that against Lutorius Priscus, a knight who had obtained great success with some verses he had composed on the death of Germanicus. Tiberius himself, relaxing from his usual reserve and parsimony, had rewarded the well-timed compliment with an imperial largess. On the occasion of an illness which occurred to Drusus, the poet was tempted to try the fortune of his muse again, and prepared a second dirge, in anticipation of a second decease in the Cæsarean family. Drusus recovered; but the author's vanity prevailed over prudence and propriety, and he recited his verses before a fashionable audience. The matter became noised abroad, an information was laid against the culprit, and on the motion of Haterius, a consul designate, the senate condemned to death as guilty of speculating on a Cæsar's death, and therefore, by an easy inference, of compassing it by wishes and prayers. Of the senators two only ventured to excuse him on the ground of thoughtlessness and levity: exile they would have

[1] Tac. *Ann.* i. 74.

regarded as sufficient punishment for a fault which could hardly be expected to find imitators. But their representations were unavailing. The wretched man was dragged to prison and immediately strangled. Tiberius, who was absent from Rome at the time, was mortified at this sanguinary proceeding, and still more, perhaps, at the indecent haste with which it had been conducted. Refraining from any direct censure of Haterius, or the senate generally, he contented himself with praising the sentiments of the more merciful minority, and decreed that henceforth an interval of ten days should always elapse between sentence and execution, to leave room for the exercise of pardon. This considerate provision continued in force not only during the government of Tiberius, but under his successors also.[1]

Case of Ennius. A. D. 22. A. U. 775.

But the senate pretended, in its servile adulation, to grieve at the restraint which the emperor thus imposed on its headlong zeal in defence of his dignity. A knight named Ennius was soon afterwards denounced for having melted down an image of the emperor, and converted it into plate for the service of the table. On this occasion Tiberius peremptorily forbade proceedings to be instituted. Thereupon, Ateius Capito, now grown grey in reputation as the most eminent jurist of his times, assumed the tone of injured liberty, and complained that the fathers should be debarred from the free exercise of their undoubted right of judgment: the crime, he declared, was a grave one, and however mild he might be in avenging a private wrong, he for one could not suffer the majesty of the republic to be assailed

[1] For the story of Lutorius Priscus, see Tac. *Ann.* iii. 49—51., under the date A. U. 774, A. D. 21. Dion (in lvii. 15.) relates that a certain Vibius Rufus prided himself on possessing two great curiosities, the relict of Cicero, and the chair in which Cæsar was slain, as if the one could make him an orator, and the other an emperor; and seems to think it showed great moderation in Tiberius to overlook such a treasonable imagination.

with impunity. Tiberius knew the man, the hoary apologist for the Cæsarean usurpation, and could appreciate at its proper value this empty show of zeal for independence. He paid no regard to the objection, but persisted in his interference; not displeased at the jealousy with which the jurist was henceforth more generally regarded, who thus disgraced his own name, and degraded in the eyes of the citizens the dignity of his science.[1]

Case of Silanus. A. D. 22. A. U. 775.

Such, indeed, was the proneness of the senate to this mode of flattery, that no public charge against an illustrious citizen seems to have been thought complete, unless coupled with the imputation of disrespect towards the emperor.[2] Thus about the same time we hear of Silanus, proconsul of Asia, being accused of extortion; but no sooner was the impeachment set forth, than a consular, an ædile, and a prætor started up with some other vague charges against him, as that he had *profaned the divinity of Augustus, and disparaged the majesty of Tiberius.* In the trial which followed the emperor seems to have disdained to take notice of these accessory incriminations. The case against Silanus was sufficiently clear. He had not the courage or the eloquence to defend himself, but threw himself despairingly on the imperial clemency, and the dignity of his own family, for protection. Tiberius, however, fortified by the conduct of Augustus in a case of similar guilt, and glad to gratify the popular sentiment by making an example of so noble a culprit, encouraged the senate to proceed to sentence against him; and when it decreed the punishment of relegation to an island, interfered only to mitigate the penalty by naming Cythera as the place of con-

[1] Tac. *Ann.* iii. 70.

[2] Tac. *Ann.* iii. 38.: "Postulaverat repetundis, addito majestatis crimine, quod tum omnium accusationum complementum erat."

finement, instead of the more inhospitable rock of Gyarus.[1]

Case of Apuleia and Lepida, A. D. 17. A. D. 20.

Tiberius had exhibited similar magnanimity in two previous cases, which are reserved to be mentioned together, because they relate to women; for political charges against women were a new feature in Roman procedure. Apuleia Varilia was a connexion of the imperial family, being a granddaughter of Octavia; as such, the crime of adultery, with which she was charged, became an offence against the law of Majesty. But to enhance her guilt, expressions of disrespect towards Augustus and Tiberius, and even against Livia, were imputed to her. Upon the first and principal charge the emperor was satisfied with referring the prosecutors to the Julian law of adultery: he refused to listen to the charge of disrespect towards himself and his mother; the insinuation of an offence against the sanctity of Augustus he would alone permit to be made the subject of inquiry. This last charge speedily fell to the ground; but the licentiousness of an illustrious matron, which was amply proved, was punished with removal beyond the two hundredth milestone.[2] Nearly similar to this was the case of Lepida, who combined with her Æmilian ancestry a connexion with the Sullan and Pompeian houses, and who was esteemed of sufficient political importance to be subjected to charges of adultery and poisoning, aggravated by inquiries through the soothsayers into the destinies of the imperial family. In this instance, also, we find Tiberius exercising great moderation in regard to the charges which affected himself, first desiring the senate to dismiss them altogether, and when it persisted, forbidding the examination of the culprit's slaves against her. She was ultimately convicted on the other accusations, and interdicted fire

[1] Tac. *Ann.* iii. 66—69.

[2] Tac. *Ann.* ii. 50.

and water; but even then, the confiscation of her estates, which should properly have followed, was remitted.[1]

The injustice Tiberius has done to his own reputation.

Such was the moderation of Tiberius for several years from the commencement of his reign, in the defence of his own person and position; such was the difficulty in which he was placed by the overweening zeal of flatterers, and still more by the ambition or cupidity of senators, who sought distinction or profit from the trade of criminal accusation. Tiberius himself, besides the desire he manifested for the attainment of substantial justice, was admitted on all hands to be free from the sordid vices so common among his countrymen. He was, to use the strong but rough expression of Tacitus, *firm enough against money.*[2] But if he has failed in other respects to obtain from history all the justice he sought to obtain for his people, the cause lay partly in himself, and in the peculiar infirmity into which his excess of zeal betrayed him. The mind of Tiberius was characterized by a certain painful preciseness: he was possessed with the litigious spirit which insists on its presumed rights, in spite of every inconvenience. He was deficient in breadth of view, and sought in vain to compensate for it by subtlety and acuteness. Accordingly, we are not surprised to find that the general and statesman, the chief of innumerable armies, and the head of a confederacy of nations, was moreover a purist in his use of language, and fond of disputing with the grammarians on the exact meaning of words, full of notes and queries on the most trifling and puerile subjects of literary curiosity, in which certainly truth could not be attained, and as certainly was not worth attaining.[3]

[1] Tac. *Ann.* iii. 22, 23.
[2] Tac. *Ann.* iii. 18.: "Satis firmus adversum pecuniam."
[3] Suet. *Tib.* 70.: "Affectatione et morositate nimia obscurabat

Tiberius carried in short to the throne the temper of a pedant, and a pedant on the throne is in danger of becoming a tyrant. Hence the encouragement he unfortunately gave to the criminal informers, or delators; an encouragement which he soon acknowledged to be pernicious, and withdrew in dismay, till the distrust and apprehensions of increasing years drove him again into the same fatal course. The delator was properly one who gave notice to the fiscal officers of moneys that had become due to the treasury of the state, or more strictly to the emperor's fiscus.[1] The title was first extended from this narrow sphere to persons who lodged information in case of any offences punishable by fine; and when Augustus undertook to legislate comprehensively on the subject of marriage, its obligations and its violations, he was induced, by the great difficulty of executing the provisions of an unpopular enactment, to subsidize by pecuniary rewards informers against its transgressors.[2] It was the aim of Augustus to attach every citizen to some peculiar branch of industry: wherever he could he gave direct occupation; in many other cases he indirectly pointed out where it might be found. He now called into existence a new employment, though he did not himself live to see its progress and development. Many were the knights and senators who now learnt to make a traffic of their eloquence and accomplishments, in the service of the emperor, by the vindica-

His encouragement of the delators or criminal informers.

stylum . . . . monopolium nominaturus prius veniam postulavit." Dion (lvii. 15.) says that he suffered a project of law to drop rather than use a Greek word for which there was no Latin equivalent. Comp. also the story of Capito, in lvii. 17., and Suet. *de Illustr. Gramm.* 22.

[1] See Rein, *Criminal-Recht*, p. 814, note.

[2] Tac. *Ann.* iii. 28.: "Inditi custodes, et lege Papia Poppæa præmiis inducti."

tion of his unpopular laws. They reaped their reward not in money only,—though a portion of the pecuniary mulct fell regularly to their share, and the senate not rarely decreed them a special remuneration,—but in political distinction also, and even in a notoriety akin to fame. Their love of power was amply gratified, when they saw the criminal, a man perhaps of the noblest birth and highest position, quail before their well-known energy and audacity, and desist from a hopeless contest with their acknowledged powers of persuasion. Feared by the great, they became the patrons and champions of the people, who were always ready to behold in the attack on noble offenders a vindication of popular rights and principles. They acquired in the forum some portion of the consideration which attached of old to the sturdy independence of the tribunes, while they were thrust into the favour and confidence of the princeps, or at least of his nearest advisers, in the palace. The trade of the delator became thus, under bad emperors, the broad and beaten track of a crafty ambition.[1]

Passion of the Romans for accusation.

But this infamous practice became so marked a feature in Roman society, and affected so painfully the imaginations of the people, that it will be well to spend a few moments here in depicting to ourselves its action more widely. We must trace it back, like every other pest of the imperial times, to its first origin under the republic, when the evil inherent in its principle was disguised or even ennobled by loftier aims, and by the freshness of its growth in an atmosphere of freedom. The liberty of the Roman citizen, the prime jewel of his existence, was to be maintained at any price.

[1] On the rewards of the delators, see Suet. *Tib.* 61.; Dion, lviii. 14.; Tac. *Ann.* ii. 32., iv. 30., vi. 47.

It was maintained by a system of universal terrorism. Every citizen was invited to watch over the conduct of his compatriots, and to menace every deviation from the path of civil virtue with a public accusation. Every young noble was trained in the art of pleading, partly to enable him, when his own turn came, to defend himself; but primarily to furnish him with weapons of offence, and thereby with the means of self-advancement. Rhetoric was an instrument of power, by which he might expect to make himself admired by the people, and feared by competitors of his own class. He fought his way to public honours on the floor of the law courts, dragging successively from their benches the tribunes, the prætors, and the consuls, before whom he first began his career of eloquence. The intrigues and treasons of the men in power did not always suffice to furnish victims for this mania of impeachment: it was necessary to extend the inquisition into the provinces, and summon before the bar of Roman opinion the governors who had sinned, if not against the laws of the republic, against those at least of humanity and justice. To interest the citizens, to inflame their passions, to bias their judgments on the subject of crimes thus perpetrated on remote provincials, required great exertion of art and eloquence; but the genius and industry of the young advocates and their teachers kept pace with every demand upon them. Feelings of party were appealed to in the place of genuine patriotism. The truth of the accusation became of little importance; it was the great triumph of the rhetorician, not unfrequently gained, to baffle the interests of a political faction, without regard to the intrinsic merits of the case. The young orator, who at the age of nineteen or twenty could sway the votes of a bench of judges against some veteran proconsul grown grey in the service of the state, was marked as sure to rise to

the highest political eminence.[1] The energy and aggressive spirit of the Romans was ever conspicuous in the toga no less than in the sagum; they preferred the attack to the defence, in the forum as well as in the field.

The want, under the empire, of great and interesting topics for eloquence.

It was the glory of Cicero that he abstained in his early career, while yet his fame was to be acquired, from this common routine of prosecution, and sought the less dazzling career of a pleader for the accused. Yet in the most glowing of his effusions, both in public and private causes, he appears as the assailant; and neither humanity nor policy prevent him from declaring himself the enemy of the man against whom he seeks to enlist his hearers' prejudices.[2] The Romans made no scruple of avowing their personal animosities; the spirit of revenge with them was a virtue which a man would affect if he had it not.[3] In the heart of the Roman friendship occupied the place of love; it was invested with a sanctity and solemnity of obligation which approached almost to chivalry: but the reaction from it was an enmity not less deeply felt nor less solemnly pronounced: the foe was not less devoted than the friend.[4] Neither

[1] Thus Crassus maintained an accusation at nineteen years, Cæsar at twenty-one, Pollio at twenty-two. Tac. *de Orat.* 34.; Quintil. *Inst.* xii. 6.

[2] There are some curious passages in the speech *de Provinciis Consularibus*, in which Cicero excuses himself for seeming to waive his notorious hostility to Cæsar: "8. Me communis utilitatis habere rationem, non doloris mei." "18. Accepi injuriam; inimicus esse debui; non nego." "20. Hoc tempore rei publicæ consulere, inimicitias in aliud tempus reservare deberem."

[3] Tac. *de Orat.* 36.: "Assignatæ domibus inimicitiæ. 40. Jus potentissimum quemque vexandi, atque ipsa inimicitiarum gloria." *Hist.* ii. 53.: "Ut novus adhuc, et in senatum nuper ascitus, magnis inimicitiis clarescceret." Champagny, *Césars*, i. p. 237.

[4] The Duel, the legitimate descendant of private warfare, could have no place in Roman society, which regarded man as the citizen only, an unit in the body corporate. Personal violence was prohibited by law, and even carrying arms was interdicted. The *Cut*, the resource of sullenness and shyness, is, I believe, a strictly English

shame therefore nor humanity interfered to check this passion for accusation, in which the Romans were to the full as unscrupulous and unfeeling, though dealing with their own countrymen, as they were in invading the lands of the foreigner. This fearful vice was gilded under the free state by the splendour of the objects to which it was directed, the magnitude of the interests involved, and the abilities and powers of the giants it summoned to the contest.[1] In the atmosphere of liberty it called many corresponding virtues into action; it produced on the whole one of the highest manifestations of human nature, and taking the good with the evil, we may not perhaps be entitled to regret the existence which was permitted to it. But for the same vice, as it appeared under the empire, no such excuse can be offered. Then too, as soon as the young patrician had quitted the schools of the declaimers, he longed to make a trial of his accomplishments, and sought an object on which to flesh the maiden sword of his eloquence. There were no longer party interests into which to throw himself; the class of intriguing politicians no longer existed, whose attempts against the liberties of the commonwealth demanded his vigilance and invited his exposure; the provinces, administered at last on settled principles, and kept under the eye of the central government, afforded still some, but much rarer, cases of public wrong to denounce and avenge. What remained then for the

institution; and the formal renunciation of friendship was the last resource of outraged feeling among the Romans. Thus Germanicus sends Piso a solemn declaration that their friendship is at an end. Tiberius forbids Labeo his house. Tac. *Ann.* vi. 29.: "Morem fuisse majoribus, quoties dirimerent amicitias, interdicere domo, eumque finem gratiæ ponere." In reply to the common apology for the duel, that it prevents assassination, it may be remarked that assassination was almost unknown to a late period among the Romans.

[1] The reader should refer to the passage of Tacitus *de Orat.*, 34—37., one of the most interesting in ancient literature.

young aspirant? how exercise the gifts he had so long been fostering in private, and ventilate abroad the talents to which schools and saloons had accorded such inspiriting acclamations? The progress of special legislation, diverted as it was from the public to the private career of the Roman, entering into his dwelling and penetrating the recesses of his home life, gave birth to manifold modes of transgression and evasion, such as the prying eyes of a domestic spy alone could track. The government, which might despair of vindicating its authority by the exertions of its own officers, was grateful to the passion for forensic distinction, which now urged the aspirant for fame to drag to light every petty violation of every frivolous enactment. According to the spirit of Roman criminal procedure, the informer and the pleader were one and the same person. There was no public accuser to manage the prosecution for the government on information from whatever sources derived; but the spy who discovered the delinquency was himself the man to demand of the senate, the prætor, or the judge, an opportunity of proving it by his own eloquence and ingenuity. The odium of prosecution was thus removed from the government to the private delator; an immense advantage to a rule of force which pretended to be popular. The common right of accusation, the birthright of the Roman citizen, the palladium, so esteemed, of Roman freedom, became thus the most convenient instrument of despotism. But however odious such a profession might generally make itself, whatever the infamy to which it would be consigned by posterity, those who practised it reaped the reward they sought in money and celebrity, in influence and authority, in the favour of the prince, and not rarely in the applause of the multitude. They could wreak their malice on their private enemies under the guise of zeal for the public service; they might

gratify the worst of passions, and exult, under the shadow of the imperial tyranny, in the exercise of a tyranny hardly less omnipotent of their own. The social corruption such a state of things produced grew fast and rankly, and is marked by the swift progress of the contagion from the first raw and ignoble professors to men of real distinction in the state. Beginning with youths fresh from school, or the teachers of rhetoric themselves, it soon spread to magistrates and consulars, and many of the most illustrious statesmen of the early empire were notorious for their addiction to this meanest and most debasing of vices.

Encouragement of delation by Tiberius.

As for Tiberius himself, the fanaticism with which he strove to execute in detail the laws bequeathed him by his predecessors, induced him early to stoop to the degradation of countenancing the practice of delation. Refusing to bend under the enormous burden of public affairs, and disdaining or fearing to associate with himself any assistant, as Augustus had wisely done from the first, he strove pertinaciously to make himself familiar with the whole machinery of government, and to take a personal share in all its procedure. He was constant in attendance on the judicial trials of the senate, but only to secure the impartiality of its decisions; he assisted also at the tribunals of the magistrates, taking his seat at the extremity of the bench, to avert the suspicion of unfairly influencing them.[1] Delation he prized as the machinery by which the true ends of justice could, as he imagined, most readily be obtained. When he discovered the vile uses to which it was put, and felt its impolicy

[1] Suet. *Tib.* 33.: "Ac primo, quatenus interveniebat ne quid perperam fieret . . . . assidebatque juxtim vel ex adverso in parte primori." Comp. Tac. *Ann.* i. 75.: "In cornu tribunalis." Dion, lvii. 7. But, as Tacitus remarks, "Dum veritati consulitur, libertas corrumpebatur."

and unpopularity, he did not refuse to check and discourage it; and he established a new tribunal of fifteen senators, by the weight of whose character he may have hoped to moderate it, and afford, as was said, some alleviation to the peril and terror of the citizens.[1] Certain it is that the records of the earlier years of the Tiberian despotism abound in evidence of the emperor's solicitude for the pure administration of justice, and the constant struggle in which he was engaged with the reckless spirit of violence and cruelty, of which accusers and judges equally partook. Ultimately his own steadfastness and constancy gave way. He yielded to the torrent he could no longer stem alone. He resigned himself to the sedulous attentions of an evil counsellor, who relieved him by consummate artifice, without his consciousness, of great part of his burden, and persuaded him to neglect the rest, and leave the corruption of society to take its course. Tiberius was induced to acquiesce in the necessity of vices he had originally striven to resist, and to wrap himself in the selfish conviction that his own safety was the highest object of government. Then came the full development of the occult principles of the law of treason; then came the fierce and fanatical stimulus which was given to the appetite for delation; the conflagration raged over Rome and Italy, involving every noble mansion in its blaze, and overthrowing many to their foundations.[2] It was ruled to be criminal to perform before an emperor's effigy on a coin or ring any act which would be indecent in the presence of the emperor himself, such as to strip a slave for chastisement, or even to strip oneself for the bath;

[1] Tac. *Ann.* iii. 28.

[2] Tac. *l. c.*: "Urbemque et Italiam et quod usquam civium corripuerant, multorumque excisi status." Comp. *Ann.* i. 73: "Quibus initiis, quanta Tiberii arte, gravissimum exitium irrepserit, dein repressum sit, postremo arserit, cunctaque corripuerit."

finally, a citizen was condemned for entering a brothel with a piece of money on which the imperial countenance was stamped.[1] While the fountain of justice was polluted by founding inquiry into these offences on no express laws, but only on perverse and extravagant deductions from them, the legitimate forms of procedure were no longer carefully preserved. Though in cases of majestas the senate alone was the authorized tribunal, the prince gradually claimed to take cognisance of them himself. Tiberius ceased to abide by the ordinary rules of evidence. Augustus himself had evaded the principle of law, that a slave might not be examined by torture against his master, by causing him to be seized and sold to a public officer, and then stretched as the slave of another on the rack.[2] But even this formality was no longer observed. The penalty of death was frequently substituted for banishment, and the worst precedent of the Sullan proscriptions was sometimes followed, in subjecting the criminal's children to the same fate as himself. The property of the condemned was confiscated: if his life was spared, he might be disqualified from making a will; and if he perished before sentence by his own hand, baffled justice might avenge herself by the infliction of posthumous infamy.[3] A. D. 22. A. U. 775. On the case of Ælius Saturninus, who was flung from the Tarpeian rock for a libel on the em-

Extravagances of the Law of Majesty.

[1] Suet. *Tib.* 59. It must be remembered that the emperor's was not the only head still stamped upon the current coins. Other members of the Cæsarean family partook of that honour. The gold and silver coinage was imperial, but Augustus allowed the senate to issue the copper currency. The names, however, of the triumviri monetales do not occur on medals after the year 740, according to Eckhel, *Doctr. Numm.* v. 64.

[2] Dion, lv. 5.; Tac. *Ann.* iii. 67.

[3] Tac, *Ann.* ii. 31. This was called "damnatio memoriæ." Suetonius crowns this confusion of law and justice by saying, "Omne crimen pro capitali receptum."

peror, an historian remarks that this was one only of many instances of the infliction of death for reflections on the life and habits of Tiberius; upon which he adds, that the Romans marvelled at the impolitic jealousy which thus exposed by public processes details which, whether true or false, acquired from these processes only their general notoriety and acceptance. People, he says, imagined Tiberius must be mad to insist, often against the explicit denial of the accused, that crimes and vices had been imputed to him, which a man of sense would have willingly left unnoticed. But for the wisdom and policy of his general administration, which was still patent to the world, this hypothesis of insanity would have received general assent: as it was, his conduct in this respect could only be viewed as a strange example of human inconsistency. The particulars, however, of these charges, thus scrupulously and minutely detailed in the language of legal procedure, were preserved in the public records, which thus became an official repository for every calumny against the emperor which floated on the impure surface of common conversation. We cannot but suspect that this was the storehouse to which Tacitus and Suetonius, or the obscurer writers from whom they drew, resorted for the reputed details of a prince's habits, whom it was the pleasure and interest of many parties to blacken to the utmost. The foulest stories current against Tiberius were probably the very charges advanced against him by libellers such as Saturninus, which he openly contradicted and denounced at the time, and which would have sunk into oblivion with the mass of contemporary slander, but for the restless and suicidal jealousy with which he himself registered and labelled them in the archives of indignant justice.[1]

[1] Dion, lvii. 22, 23.

Consolidation of the Roman dominion under Tiberius.

The subjects of Tiberius, we are assured, conceived a high opinion of the wisdom and policy of his general administration. Even Tacitus, not a favourable nor even a just critic of his character, admits that his conduct in regard to the law of majesty was the only blot on a government distinguished, at least for many years, by prudence, equity, and mildness.[1] But Tacitus, as we shall presently see, is far from consistent with himself in this, as in other expressions of opinion. The first and most urgent duty of the chief of the empire, following the traditions of the consular administration, was to maintain the honour and security of her possessions abroad, and against the foreigner on the frontiers. The law of empire, in the popular view, was continual progress and aggression. To extend the limits of his own province was the business of every proconsul, and to extend the limits of every province was still reputed the paramount duty of the imperator, himself the universal proconsul. The first idea of Cæsar, on attaining sovereignty in the city, was to effect the annexation of Parthia. Augustus had no such wild ambition, no such blind instinct of conquest: he sedulously abstained in many quarters from sending forward the conquering eagles, feeling as he did that the extent of his possessions was already quite as great as one arm could control, too great indeed, as had been amply demonstrated, for the jealous co-rule of consuls and senators. Nevertheless Augustus had never wholly desisted from aggressive warfare beyond the limits of Terminus. In Egypt and Arabia, as well as still later in Germany, he had maintained views of conquest, though he had refrained from putting out in any quarter the whole strength of his armies.

[1] Tac. *Ann.* iv. 6.: "Leges, si majestatis quæstio eximeretur, bono in usu." By this we are not to understand merely the judicial procedure, but the handling of the broad principles of administration.

During his reign the empire had been increased with solid additions; and it had been no vain boast of his courtiers that he had advanced its frontiers into new zones and under unknown constellations.[1] Yet Augustus, it was well known, had left to his successor, as a legacy of political wisdom, the counsel not to extend the limits of Roman sovereignty. This advice Tiberius frankly accepted. He withdrew his legions, as soon as the ambition of Germanicus would permit him, within the Rhine; and if he allowed campaigns to be still waged in the valleys of the Atlas, these were strictly for security and not for conquest. His abstaining from the plantation of military colonies in the provinces, was a pledge of the sincerity of his peaceful policy.[2] Instead of extending the frontiers, he was intent on consolidating his possessions within them, converting tributary kingdoms into taxable provinces, and reducing restless barbarians to something more than a nominal subjection. It was under this reign, accordingly, that the far regions of Africa, so long exposed to plunder and disturbance from the nomade hordes in the recesses of their mountains, were placed in a state of security, which continued unassailed for centuries; that the authority of Rome was first established permanently throughout the wild district of Thrace, so important for connecting the conquest of Rome on the Danube with the sources of her wealth in the Lesser Asia; that Cyzicus and Cappadocia were incorporated in the universal empire, and made to contribute from their wealth or poverty to relieve the pampered impatience of taxation in Rome and Italy. All these were in fact substantial conquests, though they might not be known by such a title, in which the emperor spared no artifice nor even fraud, while he cautiously abstained, as far as

[1] Virg. *Æn.* vi. 795.: "Jacet ultra sidera tellus,
Extra anni Solisque vices . . . ."

[2] See A. Zumpt: *Comment. Epigraph.* i. 381.

possible, from the use of arms.[1] The reign of Tiberius deserves, accordingly, to be marked as an era of no trifling moment in the consolidation of the Roman power. It is probable that his own contemporaries were by no means unaware of this, and abundantly satisfied with a policy which threw many of their burdens on their subjects and auxiliaries. Victories and triumphs could have done no more. But a hundred years later, as we shall see, another emperor arose, who added wide provinces to the unwieldy bulk of his dominions, and performed martial exploits which recalled the days of the Pompeius and of Cæsar; and transient and fruitless as his successes proved, they served to point an unfavourable and unjust comparison with the bloodless gains of his predecessor. Tacitus, who wrote under the inspiration of the glories of Trajan, though admitting the general wisdom of the third Cæsar's policy, condescends to sneer at his abstinence from conquest, as something pusillanimous and unworthy of the Roman name.[2]

Stations of the legions under Tiberius.

While, however, Augustus had been obliged to entrust the conduct of his campaigns to princes raised almost to an equal rank and power with himself, his successor, by refraining from aggressive warfare, with the vast combinations it required, could keep all his lieutenants in the modest position befitting their vocation, and spare the empire the perils which might flow from an excited and pampered ambition. The legions were maintained in the same stations as

[1] Suet. *Tib.* 37.: "Hostiles motus per legatos compescuit; nec per eos nisi cunctanter et necessario. Reges suspectosque comminationibus magis et querelis quam vi repressit."

[2] Tac. *Ann.* iv. 32.: "Principi proferendi imperii incuriosus erat." Compare iv. 4. with a direct allusion to the conquests of Trajan, "Quanto sit angustius imperitatum." Here again, as in the case of delation, we see how Tacitus's estimate of the policy of Tiberius is coloured by his glowing conceptions of his own master's glory.

under Augustus. The bank of the Rhine was still guarded, as we have seen, by eight, four in the Upper, and as many in the Lower Germania. The Iberian provinces were secured by three only; for their reduction, though recent, was now justly deemed complete. Mauretania, which Augustus had at one time incorporated with the empire, had been again erected into a tributary kingdom, and given to Juba, as a present from the Roman people. The African provinces were held by two legions, and two more were stationed in Egypt. Four were assigned for the protection of the East; they were quartered principally at Berytus or the Mediterranean, at Antioch and Cæsarea, or in scattered detachments on the heights of the Taurus and Libanus: they showed a front to the Parthians on the Euphrates, and supported the trembling thrones of the petty chiefs of the Caucasus, who were maintained as a check on the more powerful sovereigns of the plains. Thrace was consigned to the defence of kings of its own nation, under Roman superintendence; while two legions were posted on the Danube in Pannonia, and as many on the same stream, after it took the name of Ister, in the lower regions of Mœsia. Two more divisions, making a total complement of five-and-twenty, were quartered in Dalmatia, and formed a reserve for the armies of the East, while at the same time they were near enough to awe the submissive populations of Greece and Lesser Asia. Their position at Apollonia, Dyrrhachium, or Nicopolis was more important from its proximity to Italy, of which, in fact, they constituted virtually the garrison; for the empire still preserved the tradition of the republic, that the legions were the instruments of foreign domination, not of domestic authority; and no legionary force was allowed to pitch its tents within the sacred limits of the land, all the free inhabitants of which were now Roman citizens. The police of

Italy was entrusted to a force of the name of which she had not yet learnt to be jealous. Three Urban and three Prætorian cohorts, the city guards and the life-guards, kept watch over the security of the metropolis and the person of the ruler; but these it was thought necessary to levy exclusively from the most central districts of the peninsula, from Latium itself or from Umbria and Etruria, and the ancient colonies of the Latin franchise.[1] Slender as these forces appear for the defence of so vast a territory, we are to remember that the auxiliary troops dispersed in the provinces where they were most needed are not included in the list; and these, we are assured, in general terms, may have equalled the number of the legionaries.[2]

The discipline of the legions strenuously maintained.

It might be easier to maintain the fidelity and discipline of these numerous armies in the excitement of warfare than under the dull monotony of the camp in time of peace. Tiberius's success in this respect,—for after the first commencement of his reign there was no mutiny, nor even the seditious attempt of a discontented officer,—arose no doubt from his firmness in refusing concession to demands for relaxation and indulgence. The complaints which startled him on his accession to power were put down partly by the vigour of his envoys,

[1] In giving this list of the legions, Tacitus (*Ann.* iv. 5.) refers particularly to the ninth year of Tiberius (A. U. 776, A. D. 23). He does not mention, and seems indeed not to know of any German guards at Rome. Augustus, we have seen, had such a body-guard; but he dismissed them after the defeat of Varus, and it is probable that they were not re-embodied by his successor.

[2] Tacitus points out this difference between the legions and the auxiliary cohorts, that the latter were constantly moved from place to place, while the former were kept stationary. The exact proportion of auxiliaries was uncertain, and no doubt varied. Dion, lv. 24. That they were generally about equal to the legionaries may be deduced from Tacitus, *Ann.* iv. 5. Suet. *Tib.* 16. and from the arrangements of the Hyginian camp. See Marquardt in Becker's *Rœm. Alterth.* iii. 2. p. 365.

the princes of his own family, but partly also by vague assurances of redress, extorted from his first alarm; these however he retracted or evaded on recovering his presence of mind. The crisis, it may be allowed, was one at which any actual concession might probably have broken down the whole system of iron discipline on which the obedience of the legions rested. Nor would Tiberius encourage the soldiers to look for extraordinary gratuities by occasional largesses, such as Augustus and Cæsar before him had so liberally dispensed. After paying them the sum bequeathed them by his predecessor, which indeed he thought it became him to double, he made no further appeal to their favour and gratitude, except on one important occasion, at a late period of his reign, in requital for a particular service.[1] He trusted, for securing their devotion, solely to the regard they entertained for his title of Imperator, and the deserts by which he had attained it.

The governors of provinces kept for several years in office.

Not only the respect in which the commonwealth was held by foreign potentates, but the submission and awe of the provincial populations depended mainly on the firmness of the hand which kept her soldiers to their standards.[2] The tranquillity and contentment of the provinces under Tiberius bear witness to his merits as commander of the Roman armies. While writers with whom we are the most familiar depict the character of this Cæsar in the most hideous colours, and only with manifest reluctance admit any circumstances which bespeak the moderation and equity of his rule, it is remarkable that the independent testimony of two provincial authorities combines to assure

[1] Tac. *Ann.* i. 36.; Dion, lvii. 5.; Suet. *Tib.* 48.

[2] Vell. P. 126.: "Diffusa in orientis occidentisque tractus, et quidquid meridiano aut septentrione finitur, pax augusta per omnes terrarum orbis angulos a latrociniorum metu servat immunes."

us that in the provinces at least his administration was beneficent, and his memory held in honour. Thus Philo of Judæa speaks in glowing terms of the wisdom and mildness of the government of Alexandria under the auspices of Tiberius, and exalts still more eloquently the happy condition of the world at the moment of his decease.[1] Again, the Jewish historian Josephus confirms the statement of others, that this emperor departed widely from the ordinary principle of provincial administration, in prolonging the stay of the proconsuls from its usual brief term to a longer and ultimately to an indefinite period.[2] This novel usage, he assures us, though allowing that it coincided with the emperor's habits of procrastination, and a certain infirmity of purpose which grew upon him in age, was conceived in a spirit of equity, and intended to remove the main cause of the sufferings of the provinces, in the ardour with which each new governor had hastened to make his fortune. Tiberius was wont to justify his policy by an appropriate apologue: —*A number of flies had settled on a soldier's wound, and a compassionate passer-by was about to scare them away. The sufferer begged him to refrain. These flies, he said, have nearly sucked their full, and are beginning to be tolerable: if you drive them off, they will be immediately succeeded by fresh comers with keener appetites.* The progress indeed of regular government seemed to demand a change on this point, which should enable the affairs of the empire to be conducted by fixed and uniform procedure, while it spared the people the fluctuations as well as the expenses incident to a continual change

[1] Philo *in Flacc.* 1, 2.; *Legat. in Cai.* 2.: τίς γὰρ ἰδὼν . . . . οὐκ ἐθαύμασε καὶ κατεπλάγη τῆς ὑπερφύους καὶ πάντος λόγου κρείττονος εὐπραγίας. This curious passage will deserve to be noticed more particularly at a later period.

[2] Joseph. *Antiq. Jud.* xviii. 7. § 5.

of governors. It serves to mark the transition now in progress in the government of the provinces, from the sway of an encamped proconsul to that of an established viceroy. There seems no reason to doubt that the conduct of Tiberius in this particular, stripped of all unfair interpretation, was part of a settled and well-meant policy, however much it may have indulged the personal indolence, to which alone his detractors have chosen to ascribe it, or agreed with his jealous indisposition to multiply the number of distinguished and confidential coadjutors.[1] But it caused, we may suppose, great dissatisfaction among the candidates for place and emolument, and may be ranked among the motives of the hatred of the nobility towards him.

Improved treatment of the provinces.

This change in the view in which the provinces were to be regarded, no longer as prostrate enemies, but as common children of the state with the citizens themselves, appears in the acknowledgment first made by Tiberius of the duty of extending the public liberality to the wants of the national dependents. A great step was gained in the cause of humanity and civilization, a great advance towards the overthrow of the selfish prejudices of conquest, when the subjects were admitted to have claims on the state as well as obligations towards it. It marks the commencement of what has been called the reaction of the provinces upon Rome, when, on the occasion of an earthquake, which overthrew not less than twelve cities of Lesser Asia, the prince proclaimed aloud that it was an imperial

[1] Suet. *Tib.* 41. 63.; Tac. *Ann.* i. 80., vi. 27. Dion (lviii. 23.) accounts for it differently: *τοσοῦτον πλῆθος τῶν τε ἄλλων καὶ τῶν βουλευτῶν ἀπώλετο ὥστε τοὺς ἄρχοντας τοὺς κληρωτοὺς, τοὺς μὲν ἐστρατηγηκότας ἐπὶ τρία, τοὺς δ' ὑπατευκότας ἐπὶ ἓξ ἔτη τὰς ἡγεμονείας τῶν ἐθνῶν, ἀπορίᾳ τῶν διαδεξομένων αὐτοὺς σχεῖν.* But whatever be the merits of the system, it was introduced in fact not by Tiberius, but by Augustus. See Dion, lv. 28.

calamity and merited relief from imperial resources.[1] The control of the provincial governors was no longer left to the casual and interested activity of self-constituted accusers, or to the jealousy of political partisans: never before had the officials been kept in the path of moderation and purity by the restraints of a systematic procedure; and the many instances in which they were still accused and convicted of rapacity and injustice may be accepted in proof, not of the increased frequency of their guilt, but of greater vigilance in detecting it. It will be remarked, also, on examining the cases of this kind recorded, that they refer more commonly to the senatorial, such as Asia and Africa, than to the imperial provinces.[2] In the latter the officials were appointed more directly by the emperor himself, and their duties and prerogatives more definitely prescribed. Good conduct, whether in the highest posts or the lowest, secured them undisturbed enjoyment of their places for many years or even for their lives. The happier lot of these provinces is attested by the fact that, to be removed from the rule of the senate and placed under that of the emperor, was regarded as a boon by the provincials themselves.[3] The old plan, indeed, of farming the revenues of the provinces by the publicani, now as heretofore generally Roman knights, still continued in force: the time had not yet arrived, perhaps, when this system, which recommended itself

[1] Tac. *Ann.* ii. 47. (A.U. 770, A.D. 17), alluded to also by Pliny, *Hist. Nat.* ii. 86.: "Eodem anno xii. celebres Asiæ urbes collapsæ nocturno motu terræ." Their taxes were remitted for a term of years, large sums were granted them in ready money, and a special commissioner was sent by the senate to superintend its application. See above, chap. xliii. The twelve cities all lay in the district of Lydia. This earthquake is perhaps the most destructive of any on record. Comp. Von Hoff, *Phänomen*, iv. 169. But even while I write the city of Brousa is trembling to its foundation with another.

[2] See Hæck, *Pœm. Gesch.* i. 3. 98.

[3] Comp. Tac. *Ann.* i. 76.: "Achaiam et Macedoniam onera deprecantes levari in præsens proconsulari imperio tradique Cæsari placuit."

quite as much for its simplicity and convenience as for the means it afforded of enriching the ruling class, could be dispensed with. The corporation of publicani, which engaged for the revenues of a district, required the heads of towns and cantons to assess the proportions of houses and families; and probably the levy was thus on the whole more equitably as well as more economically made, with the aid of local knowledge, than it would have been by processes more familiar to ourselves, and adapted to more homogeneous populations. But Tiberius deserves credit for the firmness with which he resisted the temptations which commonly beset a government under this method of taxation. He refused to apply the screw to his financial agents, and require the larger return which he was assured might easily be extracted from them. *A good shepherd,* he was wont to say, *must shear his sheep and not flay them.*[1] Among his wholesome regulations for the protection of the provincials against the rapacity of their rulers was a decree, by which the officers, however guiltless they might be themselves, were made responsible for the misconduct of their consorts in this particular: for the women, it was found, were more prone to take bribes and sell the favours of the government than the men. He ruled, however, after a debate, the details of which are curious and not uninstructive, that the attendance of the wives upon their husbands abroad was a less evil than such as might flow from forbidding them that indulgence.[2]

Government of Italy and the city.

But the care of Tiberius was not confined to the provinces. He devoted himself with untiring industry to the reform of abuses in the government of Italy, to assuring general security and tranquillity, and alleviating distress.

[1] Suet. *Tib.* 32.: "Boni pastoris esse tondere pecus non deglubere." Comp. Tac. *Ann.* iv. 6.; Dion, lvii. 10. [2] Tac. *Ann.* iv. 20. foll.

He protected the inhabitants from robbers and banditti by military posts in various places, and stimulated the diligence of the city police. His measures for maintaining order in the capital were temperate and well considered. Instead of treating the players, whose over-ardent admirers were constantly fighting and rioting about them, as mere servants of the government, and subjecting them again, as before the time of Augustus, to the rods of the prætor, he was satisfied with reducing the public grants for their encouragement, and forbidding the senators from entering their dwellings, and the knights from trooping round them in the streets: the theatre alone, he declared, was appropriated to visiting them. At the same time, they were no longer held responsible for the peace of the city; but the penalty of banishment was denounced against the spectators who should cause disturbances there.[1] On occasion, however, of a riot which occurred in the year 776, we find that both the players themselves, and the leaders of the theatrical factions, were expelled together from the city, nor was the emperor prevailed on, by the most pressing instances, to recall the offenders.[2]

Control over the players.

This interference with their amusements was a grave offence to the populace. When Tiberius limited the number of gladiators in the arena, the citizens complained with bitterness that he took no genial pleasure in the old Roman recreations. They were indignant at having their draught of blood measured to them by drops. Though all classes were equally addicted to the crime or folly of consulting conjurors and diviners, the measures which Tiberius enforced, after the example

The soothsayers expelled from Italy.

[1] Tac. *Ann.* i. 75.; Suet. *Tib.* 34. Comp. *Digest.* xlviii. 19. 28. § 3.; Vell. ii 126.: "Compressa theatralis seditio."

[2] Suet. *Tib.* 37.; Tac. *Ann.* iv. 15.

of Augustus, Agrippa, and the legislators of the free state before them, for expelling the astrologers from Italy, caused far less dissatisfaction. This latter prohibition, indeed, was easily evaded.[1] The emperor himself, the most superstitious of his nation, could not resolve to rid his own palace of the herd of soothsayers, who so well knew how to play upon his fears and hopes. While he indulged himself in prying into his own future fates, he could not prevent the inquiries of friends or enemies, flatterers and intriguers: to cast the imperial horoscope became the dangerous amusement from which few courtiers or politicians had the firmness to abstain. The *Mathematici*, said Tacitus, are a class who mislead the ambitious and disappoint the powerful; who will always be forbidden a place among us, yet will always be retained here.[2]

Suppression of the Egyptian and Jewish rites.

These measures against the astrologers were not more ineffectual than those which Tiberius also took for the suppression of Egyptian and Jewish rites. He was not led, however, to these regulations by the principles which animated his predecessor. He did not regard himself as the defender, or restorer of the ancient cult, as the patron of Roman observances in opposition to novel and extraneous usages. He looked merely to the practical evils which might result from any heterodox movement, and his zeal against these Oriental innovations was roused by the mystery in which they were for the

[1] Tac. *Ann.* ii. 32. One of these people was thrown from the Tarpeian rock, another was beaten to death with the stick, the ancient military punishment. Tacitus says, "Consules extra portam Esquilinam, cum classicum canere jussissent, more prisco advertere." This is explained by Suetonius. *Ner.* 49.: "Nudi hominis cervicem inserere furcæ et corpus virgis ad necem cædere."

[2] Tac. *Hist.* i. 22.: "Genus hominum potentibus infidum, sperantibus fallax, quod in civitate nostra et vetabitur semper, et retinebitur."

most part shrouded, by the nocturnal ceremonies which they generally affected, and by the connexion with the dreaded inquiry into the future generally ascribed to them. A single case of gross scandal imputed to the priests of Isis at Rome was sufficient perhaps to give colour to the emperor's strong proceedings against that cult and its followers. The statue of the goddess was precipitated into the Tiber, and her rites forbidden in the capital.[1] Similar measures were taken against the religious observances of the Jews at Rome. When required to enlist in the Roman armies, this people pleaded their ancient national prejudice against military service, and the indulgence it had enjoyed from earlier Cæsars. But this refusal was now made a pretext for accusing them of disloyalty, for the prohibition of their worship, the demolition of their sacred instruments and vestments, and finally their expulsion from Italy. Four thousand freedmen, of Jewish origin or tenets, were drafted from Rome into Sardinia, to repress the brigandage of that wild region.[2] It would seem, however, that at a later period Tiberius relaxed in his severity towards this people, and adopted means of conciliating them. They were fain to believe that the harshness of his earlier legislation was due to the malignant influence of the detested Sejanus.[3]

[1] See in Josephus (*Antiq.* xviii. 3.) the story of Mundus, whose licentious passion was gratified by the priests of Anubis.

[2] Tac. *Ann.* ii. 85.: "Quatuor millia libertini generis ea superstitione infecta: et si ob gravitatem cœli interissent, vile damnum." I infer from the construction that the writer here expresses the sentiment of the decree itself, rather than his own. Suet. *Tib.* 36.: "Judæorum juventutem per speciem sacramenti in provincias gravioris cœli distribuit." Comp. Senec. *Ep.* 108. The incident has been already referred to in chap. xxxiv. The victims, as I suppose, were partly Jews by extraction, but perhaps more generally proselytes of Greek or Asiatic origin.

[3] Philo, *Legat. ad Cai.* 24. On the statement of Tertullian (*Apol.* 5.), regarding the favour, as he pretends, of Tiberius towards Christianity, I shall speak on a future occasion.

Limitation of the right of asylum.

The establishment of a regular system of legal protection for subjects of every degree went hand in hand with the abolition or limitation of such irregular substitutes for it as the right of asylum, with which religious feeling had stepped in where human law failed to perform its duty. It was chiefly in the eastern provinces that this right of asylum was recognised and sanctioned by long usage and favour. The multiplication of these places of refuge, fostered by the cupidity of the priests, had extended a dangerous impunity to all manner of crimes, and increased the number of offenders. Such, however, was the influence of the priests on the superstition of the vulgar, that every attempt to check this encouragement to disorder had been vehemently resented, and had led in many cases to disturbances and riots. Tiberius undertook to abate the nuisance, and acted with good sense and decision. He required the cities which exercised this right of protection in their cherished fanes, to produce just grounds, by prescription or legal ordinance, for the claims they advanced. He limited the extent of territory to which the privilege should apply, for it was claimed not for the sacred walls only, or the outer inclosure of the temple, but often for large tracts of land around them; he defined, perhaps with greater strictness, the character of the offences to which protection should be granted; and thus, without abolishing the institution itself, he set some bounds to its licence, with the approbation, no doubt, of the wisest of his subjects.[1] In Rome, the centre of law and rights well understood, the privilege of asylum had never flourished as in the more disturbed regions

[1] Suet. *Tib.* 37.: "Abolevit et jus moremque asylorum quæ usquam erant;" but Tacitus (*Ann.* iii. 60.) modifies this statement: "Crebrescebat Græcas per urbes licentia atque impunitas asyla statuendi . . . . facta senatusconsulta quis, magno cum honore, modus tamen præscribebatur."

of the East. Nevertheless the tribunitian sanctity of the emperor became gradually extended to his statues, and culprits or fugitive slaves, on touching an image or picture of the august personage, were allowed to defy the law, and the privileges, otherwise unbounded, of their masters. This means of protection was soon turned to a weapon of offence; holding up an imperial coin between his thumb and finger, any ruffian might stand in the public streets and rail with impunity against the honourable and noble: the client might abuse and threaten his patron, the slave might even raise his hand against his master. This flagrant abuse was not checked, for none ventured to brave the delators, who might easily frame on the attempt a process of majestas, until a senator having been pelted with opprobrious language by a woman, a notorious delinquent, whom he was bringing to justice, Drusus himself, at the request of the perplexed fathers, interposed and threw the offender into prison, in spite of the emperor's image which she eloquently brandished in his face.[1] A. D. 21. A. U. 774.

This insolent defiance of public opinion and the general sense of morality was an ominous sign of the times. No sumptuary laws, though sanctioned by the wisest politicians, and invoked by the uneasy consciences of the citizens themselves, availed to stem the dissipation and extravagance, which increased with every restriction upon nobler aims and occupations. The vast sums notoriously expended on the dainties of the table, the profusion of table ornaments, plate, and jewellery, and the extravagant prices given for articles of mere fashion, such as vases of mixed Corinthian metal, and boards of Numidian citron-wood, provoked the indignation of the morose Tiberius.[2] He urged the Flagrant dissipation of the times.

[1] Tac. *Ann.* iii. 36.

[2] Tertull. *de Pallio*, 5.: "M. Tullius quingentis millibus orbem citri emit, qua bis tantum Asinius Gallus pro mensa ejusdem Mauro-

senate to repression. But his counsellors were indisposed to strong measures, and the emperor himself soon wearied of the hopeless struggle. Contenting himself with some trifling regulations for appearance sake, he acknowledged with a sigh that the times were not fit for a censorship of manners. When the ædiles represented that the sumptuary laws of Augustus, fixing the prices for certain articles of luxury, were habitually disregarded, he replied that those after all were but trifling matters compared with the real dangers accruing to the commonwealth from the demands of selfish cupidity and the accumulation of great estates. *Italy*, he exclaimed, *yea, Rome herself depends for her daily food on foreign harvests, on the vicissitudes of the weather, and the uncertain humours of the Ocean. Unless our provinces come to our support, will our farms maintain us, or our forests feed us?* He alluded to the neglect of cultivation throughout the peninsula, which was now generally remarked, and to the complaints which had grown in force for a hundred and fifty years, of the decline of the ancient strength of the country, the population of free labourers. This, he said, was a graver concern than the price of plates and dishes; the latter might be a fitting matter for the ædiles to care for, as consuls, prætors, and every other magistrate had each their proper sphere of vigilance; but something of higher and more general interest was demanded of the princeps. While therefore he maintained the peace and credit of the empire, and quelled the turbulence or corruption of the assemblies, and the faction of the senate,—while he provided for the wants of the day before him, and supplied an abundance of grain to the city,—he cast on the ædiles

Tiberius despairs of checking it by sumptuary laws. A. D. 22. A. U. 775.

taniæ numerat." Comp. Lucan, ix. 426., x. 144.; Petronius, *Satyr.* 119.; Martial, ix. 60. Plin. *Nat. Hist.* v. 15.

the care of the sumptuary enactments which were vainly expected to train the age to economy, but which the age rejected with insolent contempt.[1]

Shamelessness of both sexes.

As regarded public morality, Tiberius marched in the steps of his predecessor, not indeed in the spirit of an enthusiast, or with any ardent aspirations for the purity of the Roman blood or honour of the Roman name, but as a matter of duty and discipline. He resented the insensibility to shame of many of the young citizens even of knightly or senatorial families, who, in their passion for displaying their accomplishments as singers or dancers on the stage, a degradation strictly forbidden to their class, contrived to get themselves legally degraded, to enable them thus to present themselves with impunity. Against this ignoble evasion new and more stringent edicts were levelled. In making the licentiousness of a Roman matron a public offence, Augustus had overshot his mark. Among other impediments which arose to the enforcement of the Julian legislation on this delicate subject, it was found difficult to induce disinterested persons to prosecute as public accusers. Possibly it was with the view of obviating the scandal of open procedure in such lamentable cases, that Tiberius revived the primitive usage, and delivered the culprits to be tried and punished by their own kinsmen, *after the manner of the ancients*. In the olden time, these domestic tribunals had inflicted even death for trifling indecorums. But the law allowed the defenceless frail ones a method of escape, which some women did not scruple to embrace. The penalties of irregularity were strict and severe; but from these professed prostitution was exempted, and immunity might be purchased by exchanging the

[1] Tac. *Ann.* iii. 53, 54.; Vell. ii. 126.: "Revocata in forum fides, summota e foro seditio, ambitio campo, discordia curia . . . . quando annona moderatior?"

decent stole of matronhood for the toga of the avowed courtesan.[1] While resort to this disgraceful refuge was confined to a few plebeian cases it attracted little notice; when, however, wives of men of the highest class were found to inscribe themselves on the ædile's list, to escape the loss of dowry, confiscation, and banishment, the penalties of the Julian law, the princeps determined to close this last means of retreat, by a new and sweeping edict.[2]

Immorality ascribed to Tiberius.

The Roman legislators had never been famous for adhering in their own persons to the rules they enforced on their fellow-citizens. What then, it may be asked, was the private character of the man who showed himself thus harsh and prudish in his public capacity? His amusements and relaxations, no mean element in the character of every Roman, were frivolous rather than corrupt; nor yet, at least, can he fairly be charged with habits of excessive indulgence. In regard to women, there is no evidence against the morals of Tiberius up to the period we are now considering: towards the wife of his choice he had shown strong affection, while as to the worthless consort who was imposed upon him, however sternly he may have resented her profligacy, we know not that it was provoked by similar profligacy on his part. The prejudices of the Romans were early excited against him, and no reliance can be placed on their malicious assertions that his natural reserve was a mask assumed to conceal the grossest improprieties. On this score, neither history nor anecdote has any story at this time against him: the charge of habitual intemperance rests

[1] Hor. *Sat.* i. 2. 63.: "Quid interest in matrona, ancilla, peccesve togata?"

[2] Tac. *Ann.* ii. 85.; Suet. *Tib.* 35. The enactment on this subject, cited by Papinian (*Dig.* xlviii. 5. 10.), is probably that of Tiberius: "Mulier quæ evitandæ pœnæ adulterii gratia lenocinium fecerit aut operas suas scenæ locaverit, adulterii accusari damnarique ex senatus-consulto potest."

chiefly upon a ribald epigram, which may have originated in the licence of the camp[1]; while the saying ascribed to him that a man must be a fool who required a physician after thirty, seems to show that he enjoyed robust and equal health, such as was never maintained through a long life by a confirmed drunkard.[2] Nor can we doubt the untiring perseverance with which Tiberius devoted himself through at least the greater part of his principate to the engrossing cares of his station, cares which above all others demanded a clear head and a sound body. For several years he never quitted the dust and din of Rome for a single day, and his time was given without intermission to the discussions of the senate, to the procedure of the tribunals, to conferences with foreign envoys, and every other detail of his world-wide administration. The charge of profligacy, up to this period, but slightly supported by external testimony, falls to the ground before such strong internal evidence of its falsehood.

His simplicity and frugality

But the morality of Tiberius was not confined to abstinence from gross vice, or refraining from luxuries and indulgences which might have been less unsuitable to his position. He

[1] Pliny asserts indeed that Tiberius was intemperate in his youth, but admits that no such charge could be laid against him in his latter years. Plin. *Hist. Nat.* xiv. 28.: "In senecta jam severus; sed ipsa juventa ad merum pronior fuerat." He tells an anecdote, or rather a popular surmise, which must be taken for what it is worth, that he selected Lucius Piso for the post of prefect of the city on account of his admirable qualities as a boon companion; as, for instance, that he could drink for two days and nights without intermission. Plin. *l. c.* Comp. Senec. *Epist.* 83.

[2] The holding of this paradox, attributed to the great Napoleon and others, always indicates exuberant health and spirits. Suetonius says of Tiberius on this point (*Tib.* 69.): "Valetudine prospera usus est, tempore quidem principatus pæne toto propre illæsa, quamvis a tricesimo ætatis anno arbitratu eam suo rexerit, sine adjumento consilioque medicorum." Tacitus (*Ann.* vi. 46.): "Solitus eludere medicorum artes, atque eos qui post tricesimum ætatis annum ad internoscenda corpori suo utilia vel noxia alieni consilii indigerent."

was anxious to exhibit the ancient ideal of the Roman statesman in practising the household virtues of simplicity and frugality. His domestic economy, formed on the pattern of Augustus, received additional hardness and severity from the habits of the camp, with which he had been so long familiar. The number of his slaves was limited; the freedmen who managed his private concerns were kept strictly within the bounds of modesty and propriety. Their services were rewarded with exactness, but at the same time parsimoniously; nor did their employer ever surrender to them any portion of his real authority, or allow them undue influence over himself.[1] The carefulness he exhibited in the government of his household was an earnest of the economy of his public administration; and as such the citizens might, at least, have admired it, however few imitators it could find among them. But Augustus had had the art of combining personal simplicity with a wise liberality in public matters, which was beyond the conception of his more narrow-minded successor. The people were piqued at the cessation of the largesses which used to flow to them from the coffers of their inimitable favourite. Tiberius, who took no pleasure in the sports of the theatre or circus, and could not, like Augustus, good-humouredly affect it, reduced the salaries of the mimes and the numbers of the gladiators. He lavished no treasures on the decoration of the city, content to execute with scrupulous fidelity the designs his predecessor had left uncompleted. Yet he too could, on worthy occasions, exhibit munificence on an imperial scale. His relief to the ruined

[1] Tac. *Ann.* iv. 7.: "Rari per Italiam Cæsaris agri, modesta servitia, intra paucos libertos domus: ac si quando cum privatis disceptaret, forum ac jus." But a darker colour is presently dashed into the modest drab: "quæ cuncta non quidem comi via sed horridus ac plerumque formidatus, retinebat tamen, donec," &c.

cities of Asia was conceived in the spirit of an Augustus or a Julius, and the aid he extended to the decayed scions of noble houses at home showed that he could be generous from policy, as well as sparing from temper.[1] In times of scarcity he did not fail to check the rise of prices, according to the best lights of his day, by compensating the dealers in grain from his own means; and from the same well-managed resources he indemnified the citizens for their losses by the great fire which ravaged the quarters of the Cælius and Aventine.[2] The whole empire reaped abundant fruits from this prudent considerateness, in the undiminished supply of all sources of public revenue, and the opening of new ones. The government was enabled to fulfil every engagement with punctuality: its civil officers, regularly and adequately paid, had no excuse for extortion, its soldiers were kept within the bounds of discipline, and, receiving punctually their daily dole, submitted without a murmur to the labours of the camp and the threats of the centurion.

His moderation in regard to money.

At the same time, with all his frugality, Tiberius obtained the rare praise of personal indifference to money, and forbearance in claiming even his legitimate dues.[3] In many cases in which the law enriched the emperor with the property of a condemned criminal he waived his right, and allowed it to descend to the heir. He frequently refused to accept inheritances bequeathed him by persons not actually related to him, and checked the base subservience of a death-bed

[1] Vell. ii. 126.: "Fortuita non civium tantummodo sed urbium damna principis munificentia vindicat."

[2] Comp. Tac. *Ann.* ii. 87., iv. 64., vi. 45.; Vell. ii. 130.; Suet. *Tib.* 48.; Dion, lviii. 26.

[3] Tacitus (*Ann.* iii. 18.) says of him, as before quoted, "Satis firmus, ut sæpe memoravi, adversus pecuniam." Comp. Dion. lvii. 10. 17.

flattery. With all these genuine merits towards the commonwealth, he was not blind to the advantage he might derive from pretending to another virtue, which ranked high in the estimation of the Romans, but to which he had no real claim. From the commencement of his principate he affected the most obsequious deference to the state, as represented by the senate, the presumed exponent of its will. His first care was to make it appear to the world that his own preeminence was thrust on him by that body, which alone could lawfully confer it. We have seen under what disguises, and by what circuitous processes, he had gradually drawn into his own hands the powers, by which he seemed only seeking to enrich the senate at the expense of every other order. The promptness of its adulation, the proneness of its servility, he strove to check sometimes with grave dignity, at others with disdainful irony. When it proposed to call the month of November, in which he was born, after his name, as July and August had derived their titles from his predecessors, *What*, he asked, *will you do if there should be thirteen Cæsars?*[1] He would not allow himself to be called, in the addresses of its members, *Dominus* or *Lord*, as the style of a slave towards his master, nor his employments *Sacred*, as belonging only to divinity; nor again would he have it said that he *required* its attendance at his summons. He never entered the Curia with an escort of guards, or even of unarmed dependents, and rebuked provincial governors for addressing their despatches to himself, and not always to the senate.[2] His own communications to the august order were conceived in a tone of the deepest respect and even subservience. *I now say*, he would declare, *as I have often said before, that a*

His show of deference to the senate.

[1] Dion, lvii. 18.

[2] Suet. *Tib.* 27. 30. 32.

good and useful prince should be the servant of the senate, and the people generally, sometimes of individual magistrates. Such was his demeanour throughout the first years of his government; it was only late, and by degrees, that he drew forth the arm of power from the folds of this specious disguise, and exhibited the princeps to the citizens in the fulness of his now established authority. But even to the last, though capricious and irregular in his behaviour, we are assured that his manner was most commonly marked by this air of deference, and the public weal continued still to be manifestly the ruling object of his measures.[1]

The promise of his reign marred by defects of temper and demeanour.

We have here before us the picture of a good sovereign but not of an amiable man. Had Tiberius been so fortunate as to have died at the close of a ten years' principate, he would have left an honourable though not an attractive name in the annals of Rome: he would have represented the Cato Censor of the empire, by the side of the Scipio of Augustus and the Camillus of Cæsar. The sternness and even cruelty he had so often exhibited would have gained him no discredit with the Romans, so long as they were exerted against public offenders for the common weal, and for no selfish objects. Even the suspicion which from the first attached to him of having procured the death of Agrippa was probably little regarded: the exile of Augustus was already branded as a monstrous production of nature which ought never to have been reared, and might with little blame be got rid of. But as the fine and interesting features of his person were marred by a constrained and unpleasing mien and expression, so the patience, industry, and discretion of Tiberius were disparaged

[1] Suet. *Tib.* 29. 33.: "Paulatim Principem exseruit, præstititque, et si varium diu, commodiorem tamen sæpius et ad utilitates publicas proniorem."

by a perverse temper, a crooked policy, and an uneasy sensibility. The manners of the man, a martinet in the camp, a clerk in the closet, a pedant in the senate-house, carried with them no charm, and emitted no spark of genius to kindle the sympathies of the nation. The princeps, from his invidious and questionable position, if once he failed to attract, could only repel the inclinations of his subjects. If they ceased to ascribe to him their blessings, they would begin without delay to lay to his charge all their misfortunes. The mystery of the death of Germanicus threw a blight on the fame of Tiberius from which he never again recovered. From that moment his countrymen judged him without discrimination, and sentenced him without compunction. The suspicion of his machinations against Germanicus, unproved and improbable as they really were, kindled their imaginations to feelings of disgust and horror, which neither personal debauchery, nor the persecution of knights and nobles, would alone have sufficed to engender.[1]

[1] Tacitus, we have seen, had special inducements to do less than justice to Tiberius; nevertheless, his account of the tyrant is not on the whole inconsistent. But there is no part of Dion's history in which he fails so much as in his delineation of this Cæsar's character. It is a mere jumble of good and bad actions, for which the writer sometimes apologizes, and insinuates as his excuse that the author of them was mad. The stories, however, themselves are often extravagant and puerile. Such, for instance, is that of the architect, who, being sentenced to banishment by Tiberius from mere spite, because he had performed the wonderful feat of straightening an inclined wall, in order to ingratiate himself with the tyrant, threw a glass vessel to the ground, picked up the fragments, and set them together again, whereupon he was immediately put to death, as too clever to be suffered to live. (Dion, lvii. 21.; comp. Petronius, *Satyr.* 51. The origin of the story may be traced perhaps to a statement in Pliny, *Hist. Nat.* xxxvi. 66.) There is something Oriental in the turn which the fancy of Dion not unfrequently takes.

CHAPTER XLV

Comparison between Augustus and Tiberius.—Sejanus useful without being formidable.—Disturbances in Africa and revolt in Gaul.—Overthrow of Sacrovir (A. U. 774).—The tribunitian power conferred upon Drusus (A. U. 775).—Intrigues of Sejanus: establishment of the Prætorian camp.—Drusus poisoned by Sejanus (A. U. 776).—Deterioration of the principate of Tiberius.—Death of Cremutius Cordus and others.—Sejanus demands the hand of Livilla, and is refused by Tiberius.—He conceives the project of withdrawing Tiberius from Rome.—Retirement of Tiberius to Capreæ (A. U. 780).—His manner of life there.—Further deterioration of his government.—Death of the younger Julia and of the empress Livia (A. U. 782). (A. U. 774—782, A. D. 21—29.)

Comparison between Augustus and Tiberius: the man of genius and the man of ability. A. D. 21. A. U. 774.

I HAVE described the rise and progress of Tiberius to a distinguished eminence among Roman statesmen: I have now to introduce the reader to the decline and fall of his well-earned reputation. The ruin of so fair a character, and the frustration of such respectable abilities and virtues was not the work of a day, nor the effect of any single crime or failure. The temper of the times and the circumstances of his position presented the most formidable obstacles to a sustained good government, which the Romans had not perhaps the patriotism to appreciate or support. But the honourable ambition of the second princeps to see everything with his own eyes, and execute everything with his own hands, was in fact itself suicidal. Augustus, with the Roman world exhausted and prostrate at his feet, craving only to be moulded by his policy and informed with inspiration from his mouth, had accustomed himself from the first to act by able and trusty ministers. He was wisely con-

tent to see many things with the eyes of a Mæcenas, to act in many things with the hands of an Agrippa. His bravest auxiliary he ventured generously to connect with himself by the bonds of a family alliance. At a later period he educated the members of his own house to relieve him, one after another, of some of the functions of his station. Tiberius he associated with himself on terms of almost complete equality. But Augustus was a man of genius: he was the soul of the Roman empire: fame, fortune, and conscious ability had inspired him with unwavering self-reliance. It was impossible for his successor, bred in the sphere of an adjutant or an official, to have the same lofty confidence in himself, and to discard with a smile the suggestions of every vulgar jealousy. Tiberius, thoroughly trained in the routine of business, might believe himself competent to the task of government; he might devote himself with intense and restless application to every detail of the public service, and struggle against his overwhelming anxieties with desperate and even gallant perseverance. But he was animated by no inward consciousness of power, and when he felt himself baffled by the odds against him, he could not look round serenely for the help he needed. Those of his own household he repelled from him as enemies, and instead of choosing the ablest counsellor in the fittest quarter, allowed himself to fall under the influence of the nearest and least scrupulous intriguer. Even Sejanus he did not formally appoint as his minister, nor avowedly surrender to him any definite share in his affairs; but he yielded him his own mind and will in all things, let the conduct of the empire slip insensibly out of his own hands, and allowed the world to despise him as the puppet of his own minion.

It has been already represented that Tiberius, from the character of his mind, preferred the ser-

vices of an obscure and humble client to those of an associate of lofty rank and corresponding pretensions. Accordingly, in giving his confidence to Sejanus, he never contemplated raising him to a position of independent authority: on the contrary, he conceived that the meanness of his origin, the subordinate office he filled, and above all, perhaps, the mediocrity of his talents, were a sufficient guarantee against his rising into rivalry with himself. The imperial family still flourished with numerous scions: among these his own son occupied the first place; and this prince, since the death of his cousin Germanicus, united every claim of birth, years, and ability to share with his father the toils and honours of administration. In the year 774, accordingly, Tiberius appointed himself consul in conjunction with Drusus, an union, however, of which the citizens, it is said, augured unfavourably; for all the previous colleagues of Tiberius — namely, Varus, Piso, and Germanicus—had perished by violent and shocking deaths.[1] Both in this instance, and in a fifth, which afterwards followed, these forebodings, it will appear, were destined to be fatally fulfilled. A deep gloom was settling on the imperial palace, from whence no light gleamed to cheer the Roman people, and dispel with the prospect of future prosperity the misgivings which now assailed them. The emperor began to betray a disposition for retirement and solitude. The moments he could abstract from the ceaseless pressure of business he devoted to consultation with astrologers and diviners, listening to their interpretation of his dreams, and requiring an exposition of the occult meaning of every sound that reached him, or

The jealousy of Tiberius not alarmed by the inferior origin and talents of Sejanus.

The imperial family.

Tiberius and Drusus, consuls.

[1] Tac. *Ann.* iii. 31.; Dion, lvii. 20.

vision that flashed upon his sight. In order perhaps to secure himself from observation in pursuits which he had interdicted to the citizens, he was now anxious to escape from the city, where his residence had been for many years unbroken, so painful was the assiduity he had bestowed on the details of his vast administration. For this purpose he withdrew to the pleasant coast of Campania, professing that his health required change of scene and alleviation of labour, leaving the conduct of the executive in the hands of Drusus, though he retained a vigilant supervision of affairs, and constantly explained his views and wishes in despatches addressed to the senate. The behaviour of the young consul, thus watched and guided, seems to have been temperate and judicious. He smoothed the differences between the proudest and most turbulent of the nobles; and his interference was the more graceful as it was employed to enforce an act of submission on the part of a Lucius Sulla, a contemporary of his own, towards Domitius Corbulo, a man of greater age and political experience.[1] He checked, as we have seen, the licentious appeal to the imperial majesty as a protection for calumnious railing, and evaded rather than opposed the unseasonable rigour of the reformers, who asked the senate to prohibit the governors of provinces from taking their consorts with them. He had himself, he said, derived much comfort from the society of his own partner in his various military missions, and Livia, still the mirror of Roman matrons, had marched by the side of Augustus from Rome to every frontier of the empire. Drusus at this time was thirty years of age. From his earliest adolescence he had been em-

Character of Drusus.

[1] Tac. *Ann.* iii. 31. This Corbulo must be distinguished from another of the same name, whose exploits and melancholy fate will occupy some of our future pages. He had already filled the office of prætor, and is represented as an elderly personage. The younger Corbulo died nearly fifty years later.

ployed in the career of arms, and he had already been distinguished by a previous consulship in the year 768.[1] He was well known therefore both to the soldiers and the people; and though neither the one nor the other bestowed on him the regard they had lavished on his cousin, he was not on the whole unpopular with either. Even his vices were favourably contrasted with those of his father. He might be cruel and sanguinary in his enjoyment of the sports of the circus; the sharpest of the gladiator's swords received from him the name of Drusian: but this was better, in the popular view, than the moroseness of Tiberius, who evinced no satisfaction in such spectacles at all. He might be too much addicted to revelry and carousing: but this again was a fault which a few years might correct, and which showed at least some geniality of temper, more amiable than his father's reserve.[2] We have a surer evidence of his merits in the affection in which he had lived with his more popular cousin, and the tenderness he displayed for the bereaved children. Of these the eldest, known by the name of Nero, was now sixteen; the second, Drusus, was younger by a single year; while Caius, the third, was only eleven. The family of Germanicus had consisted altogether of nine, a number apparently very unusual in a Roman household.[3]

Some fresh incursions of Tacfarinas at this period within the borders of the African province induced the emperor to address a missive to the senate, to whom the government attached

Renewed disturbances in Africa.

[1] Tac. *Ann.* i. 55.: "Druso Cæsare, C. Norbano Coss. A. U. 768."

[2] Tac. *Ann.* ii. 44., iii. 37.; Dion, lvii. 13, 14.; Plin. *Hist. Nat.* xiv. 28.: "Nec alio magis Drusus Cæsar regenerasse patrem Tiberium ferebatur."

[3] The horrid practice of exposure and infanticide—"Numerum liberorum finire," as Tacitus gently qualifies it (*Germ.* 19.)—has been already referred to. The fact that women bore no distinctive prænomen, is terribly significant. It seems to show how few daughters in a family were reared.

requiring it to appoint an efficient proconsul without delay, to undertake the task of finally reducing him. The provinces allotted to the senate were precisely those in which there was least apprehension of serious hostilities, or prospect of the active employment of their governors in the camp. To equip an army for actual service, to select an experienced commander, and send him forth to reap laurels, and perhaps to earn a triumph, was to trench upon the imperial prerogative; the submissive senators shrank from exercising a right which accident had thus put into their hands, and begged to refer the choice to the emperor. With his usual dissimulation, Tiberius affected some displeasure at the duties of the fathers being thus thrown on himself; for he already bore, as he declared, a heavier burden than one man could well sustain. He refused to do more than nominate two candidates, M. Lepidus and Junius Blæsus, between whom he required the senate to make the final selection. Both disclaimed the honour; but Blæsus was uncle to Sejanus, and for him, as was well known, the appointment was actually reserved. The excuses of Lepidus were accordingly accepted; those of his rival, probably less sincere, were courteously waived; and the favourite was gratified by the elevation of a kinsman, of no previous distinction, to a place of power, which he might employ perhaps, at some future period, for the advancement of his own fortunes.[1]

Blæsus appointed proconsul.

The consulship of Drusus was distinguished, however, by commotions of far greater importance in another quarter. The success with which the Germans had defended their liberties against the invaders, had not been unobserved by the nations, pacified though they were, and bowed to the yoke for three quarters of a century, within the

Revolt in Gaul.

[1] Tac. *Ann.* iii. 35.

Rhine. For their advantage the discovery seemed to be made that the legions were not invincible; perhaps they read the secret of this decline of their efficiency in the mutinous spirit which had been manifested in their encampments. The panic which had recently pervaded Italy, the alarm Augustus had himself exhibited, and the violent measure of expelling the dreaded Germans from the city, were taken as a confession of weakness. At the same time the exactions of the fiscal officers were continued and perhaps redoubled; the demands made for military supplies had become intolerably grievous: at last some chiefs of the native tribes, men who had been distinguished with the franchise of the city, and admitted to the name and clientèle of the imperial house, were roused by the general discontent, or their own ambitious hopes, to intrigue against the power of the conquerors. The ramifications of their conspiracy extended, it was said, through every tribe in the country; its chief centres were among the Belgæ in the north, and the Ædui in the interior; the most prominent of its leaders in the one quarter bore the Roman appellation of Julius Florus, in the other that of Julius Sacrovir, a name which seems to mark him as a man of priestly family, and armed, therefore, with all the influence of his proscribed caste. But the measures of the patriot chiefs were disconcerted by the premature outbreak of the Andi and Turones. Sacrovir himself, in order to save appearances, was compelled to head his auxiliary cohorts by the side of the legionaries, and assist in coercing his own imprudent allies. Nevertheless his real sentiments did not escape suspicion; and when he threw off his helmet on the field of battle, in the exuberance, as he protested, of his courage and resolution, some of the rebel captives did not hesitate to declare that he had made himself known to his friends to divert their

missiles in other directions. Tiberius was informed of this presumed treachery, but he thought fit to take no notice of it.[1]

Insurrection of the Belgæ suppressed.

The speedy reduction of the Turones and Andi did not suppress the meditated revolt. When the moment arrived the Belgæ were not unfaithful to their engagements, notwithstanding this discouragement. Florus gained a few Treviran auxiliaries, and gave the signal for revolt by the massacre of some Roman traders. His ranks were soon swelled by followers of his own clan, and by the needy and oppressed of the surrounding tribes; but unable to make head against the Romans in the field they were driven to seek a refuge in the dense forests of the Ardennes. Here they were surrounded, captured, and disarmed, chiefly by the efforts of a personal enemy of Florus, a Gaul who himself bore the name of Julius Indus. Florus now threw himself on his own sword, and the Belgian insurrection was at once suppressed. The resistance of the Ædui under Sacrovir, who flew at the same time to arms, was more resolute and proved more formidable. The vigour of this tribe was greater, its resources and alliances more considerable, and the forces of the Romans were stationed at a greater distance from it. The rumour of the disaffection was even greater than the reality. It was reported at Rome that no less than sixty-four Gaulish states had revolted in a body, that the German tribes had united their forces with them, that the obedience of either Spain was trembling in the balance. The flower of the youth of the entire province was collected in the imperial university at Augustodunum. Arms had been purchased or fabricated in secret, and there were many brave young

Resistance of the Ædui under Sacrovir.

[1] Tac. *Ann.* iii. 40.: "Eodem anno Galliarum civitates ob magnitudinem æris alieni rebellionem cœptavere." *Ibid.* 41.: "Tiberius . . . aluit dubitatione bellum."

hands to wield them. The chiefs of every clan were followed to the field by hosts of slaves and clients, very imperfectly equipped; but considerable reliance was placed on the native gladiators, of whom some troops were maintained in the Romanized capital, who were clad in complete chain or scale armour, and were expected to form a firm and impenetrable phalanx.[1] It required a pitched battle, with numerous armies arrayed on both sides, to bring this last revolt to an issue. Nevertheless, when Silius, the Roman general, was at leisure to direct two legions, with their auxiliaries, from their quarters in Belgica, against the centre of this insurrection, its power of resistance was found to be far below the alarm it had created. The Roman soldiers were animated with the most determined spirit; the hope of plunder among the opulent cities of the long pacified province nerved their discipline and courage, while the approach of the successors of the Cæsarean conquerors spread dismay among the raw levies of the Gauls. At the twelfth milestone from Augustodunum the insurgents awaited the advance of the Romans.[2] Their main body, consisting chiefly of the naked or light-armed, was speedily broken and put to flight; the mail-clad stood their ground, because they were unable to shift it; but poles, axes, and pitchforks completed the work of the sword, and once overthrown the iron masses could rise no more.

Crushed by Silius.

Sacrovir the Druid, the leader and soul of the rebellion, had effected his escape from the field; but his associates, now cowed and spiritless, refused to defend Augustodunum,

Death of Sacrovir and completion of the war.

[1] Tac. *Ann.* iii. 43.: "Crupellarios vocant." Thierry derives the word from the Gaelic "crup," "resserrer et aussi rendre impotent; crupach et crioplach, perclus, manchot." Thierry, *Gaulois*, iii. 275.

[2] The site of this battle must, in all probability, have been to the north of Augustodunum, on the road into Belgica, from whence the Romans were advancing. It would, therefore, be almost on the spot where Cæsar routed the Helvetii in his first campaign.

and threatened to deliver him into the hands of the victors. Flying from thence to a neighbouring homestead, he engaged his few faithful companions to sacrifice themselves over his body in mutual combat, having first fired the house, and involved the scene of blood in a general conflagration. It was not till this catastrophe was accomplished that Tiberius could proclaim, in a letter to the senate, the origin, and at the same time the completion of the war.[1] He could now afford, without exciting too much apprehension, to give a full and fair account of the recent danger, and to apportion their due meed of praise to his commanders, while he claimed for himself the merit of having directed their movements from a distance. He condescended to excuse himself and Drusus for having allowed an affair of so much moment to be transacted in the field without their own active participation. It was, he felt, something new in the military annals of the republic, that the imperator, the commander of her armies and the minister of her policy, and the consul, the executive instrument of her will, should entrust her vital interests to the hands of tribunes and lieutenants: but the capital was becoming, under the regimen of a single man, of far more importance than the frontiers, and any cause of alarm from abroad must redound with double force on the centre of the empire. Now that the alarm was removed, he added, he might venture himself to quit Rome, and visit the districts so recently disturbed. The senate applauded his sagacity, and decreed a Supplication for the return he promised from his sojourn in a suburban pleasure house, such

[1] Tac. *Ann.* iii. 47.: "Tum demum Tiberius ortum patratumque bellum senatui scripsit." Velleius (ii. 129.) turns this into a compliment: "Quantæ molis bellum . . . . mira celeritate compressit, ut ante P. R. vicisse quam bellare cognosceret, nuntiosque periculi victoriæ præcederet nuntius!"

as had often been tendered for Augustus, after distant and perilous expeditions. The proposal of an individual flatterer, that he should be invited to enter the city from Campania with the honours of an ovation, he declined, not perhaps without some resentment at an excess of officious adulation, which seemed to savour of mockery.

Probably the emperor had no real intention of quitting Italy. His years and increasing infirmities might furnish a colourable excuse; the constant pressure of business close at home was in fact an adequate reason. From day to day the obsequious senators continued to urge him to regulate by his mere word every public concern, and as regularly did he reply with formal and diffuse epistles, reproving them for their indolence or timidity, and then proceeding to discuss, balance, and decide the questions submitted to his attention. In the year 775, on the completion of his son's consulship, he desired the senate to confer on him the tribunitian power in conjunction with himself, as Agrippa had been joined with Augustus, and afterwards himself, in the highest of all honorary titles. It was as a mere title indeed rather than a substantive office and function that the jealous emperor meant this dignity to be imparted. As such it might suffice to answer the murmurs he anticipated on the avowal of his own debility. Nevertheless, amidst every outward demonstration of subservience and respect, the new appointment was canvassed in some quarters with freedom, and received with ill-disguised dissatisfaction. The pride, it is said, of the presumptive emperor made him unpopular in the senate; and he was not reputed to have yet fairly earned, though indeed he had served the republic at home and abroad for eight years, a claim to be thus designated as the future autocrat of Rome. The loyalty of the Romans, at least of the proud

The tribunitian power conferred upon Drusus, in conjunction with Tiberius.

and querulous nobles, bore still a skin of soft and delicate texture, which might be wounded by the slightest shifting of the trappings in which it had arrayed itself.[1]

Ambition and intrigues of Sejanus.

But this discontent at the elevation of Drusus, and the complaints that he, at least, had no excuse from age or infirmity for declining the hardships of distant service, to which nevertheless his father did not choose to dismiss him, were prompted or fostered, we may believe, by the artifices of Sejanus. The unparalleled indulgence this man had obtained from his patron only inspired him with the ambition of supplanting the more legitimate object of imperial favour. His influence had acquired the government of Africa for his uncle, and with it the command of an army, and the conduct of an important war. On the successful issue of the campaigns in which Blæsus was now engaged, and on the final defeat, as he vaunted, of the daring foe, who, though regarded by the Romans as no better than a deserter and a bandit, had presumed to offer terms of accommodation with the emperor on the footing of a rival potentate, Sejanus succeeded in getting him leave to accept the imperatorial title from his soldiers; a military distinction now rarely and reluctantly accorded, treading, as it apparently did, too closely on the imperial designation of the chief of the state himself. Even Augustus had discountenanced the licence earned and claimed by the legions at the close of a well-fought day. Blæsus was the last Roman officer in whose case this military salutation was formally sanctioned by the emperor. It was only as the proconsul of a senatorial province that he could have any pretence for hearkening to it; and it was authorized this last time out of

[1] Tac. *Ann.* iii. 56. 59.

regard only for Sejanus, Tiberius resolving, we may believe, never again to place a nominee of the senate in a position to merit it.[1] It was fitting that the last surviving witness of the glories of the ancient Republic should expire with this final flicker of its military independence. At the close of this year, the commencement of the sixty-fourth since the fatal era of Philippi, Junia Tertulla, the niece of Cato, the wife of Cassius, the sister of Brutus, was carried to the resting place of her illustrious house.[2] In her had centred the revenues as well as the traditions of many noble families, and she gratified a just pride by distributing her riches by will among the most distinguished personages of the city, omitting only the emperor himself. Tiberius bore the slight without remark, and permitted the virtues of the deceased to be celebrated in a speech from the rostra, which could not fail to revive the memory of a thousand republican glories. But the leaders of the funeral procession, when they carried before the bier the images of the Manlii, the Quinctii, the Servilii, and the Junii, and of twenty in all of the noblest houses of Rome, were instructed to forbear from exhibiting the busts of Cassius and Brutus, who, in the pithy words of the historian, were in fact the more conspicuous for the absence of their illustrious effigies.[3]

Death and obsequies of Junia Tertulla.

[1] Tac. *Ann.* iii. 74. De la Bleterie remarks (*Mem. Acad. Inscr.* xxi.) that Cornelius Balbus, the last private citizen who triumphed, and Blæsus, the last who was saluted imperator, were both proconsuls of a senatorial province, the only one in which military operations might be anticipated. The next emperor withdrew the legion of Africa from the command of the senatorial proconsul, and placed it, as we shall see, under an officer of his own appointment.

[2] The battle of Philippi was fought in the autumn of 712.

[3] Tac. *Ann.* iii. 76.: "Sed præfulgebant Cassius atque Brutus eo ipso quod effigies eorum non visebantur."

Sejanus establishes the Prætorian camp. A. D. 23. A. U. 776.

The success which had thus far attended the intrigues of Sejanus, had inspired him with hopes the most unbounded. The prefecture of the city, with which he had been invested, was the immediate instrument of the imperial will, and though it had been held before him by Messala, Taurus, and Piso, among the most honoured names in Rome, it was not of a nature to confer either power or dignity itself. But the new adventurer conceived a design of using it to advance an inordinate ambition. Hitherto the soldiers of the prætorian guard, who were placed under his orders, were quartered, nine or ten thousand in number, in small barracks at various points throughout the city, or in the neighbouring towns.[1] Dispersed in these numerous cantonments, they were the less available on a sudden emergency: their discipline was lax, and scattered up and down among the citizens, they were liable to be tampered with by the turbulent or disloyal. Yet Augustus had never ventured on a step so bold and novel as to bring them all together into a camp, and let the citizens see and number the garrison by which they really were enthralled. He had kept no more than three cohorts or eighteen hundred men in the city or at its gates. It was left for the days of confirmed and all but acknowledged royalty, and the private ambition of a minister, to achieve this regal consummation. Perhaps the terror of the Varian disaster, when the city itself was supposed for a moment to be defenceless against a foreign foe, gave the first excuse for the change which was speedily introduced. Beyond the north-eastern angle of the city, and between the roads which sprang from the Viminal and Colline gates, the prefect marked out a regular encampment for the quarters of these household troops.

Its site and dimensions.

[1] Tac. *Ann.* iv. 2. Dion, 10,000, Tacitus and Suetonius, 9000.

The line of the existing enclosure, which was traced about two centuries later, exhibits a rectangular projection, by which the limits of the spot and its dimensions are still ascertained. An oblong space, the sides of which are five hundred and four hundred yards respectively, embracing an area of two hundred thousand square yards, was arranged like a permanent camp for the lodgment of this numerous force.[1] Having collected his myrmidons together, the prefect began to ply them with flatteries and indulgences: he appointed all their officers, their tribunes and centurions, and at the same time found means, through the agency of the senate, of advancing his creatures to employment in the provinces. It was strange to see how Tiberius shut his eyes to the manœuvres thus practised before his face. On the most public occasions he loudly proclaimed that Sejanus was *the associate of his own labours:* he permitted his busts and statues to be set up in the theatres and forums, and even to receive the salutation of the soldiers.[2]

Still, notwithstanding these unprecedented marks of favour, and the symptoms they revealed of the emperor's infirmity, Sejanus could not fail to see, in the recent elevation of Drusus, how far his master yet was from contemplating the transfer of empire from his son to a stranger. To remove the rival whom he despaired of supplanting was become necessary for his own se-

Machinations of Sejanus against Drusus.

[1] The dimensions of the prætorian camp are given in Bunsen's *Rome*, iii. 2. 359. The ordinary camp, according to the arrangement of Polybius, was a square of 2077½ English feet for a consular army of two legions, or including allies, 19,200 men. This area would contain 480,000 square yards. See General Roy's *Military Antiquities of the Romans in Britain*. According to the system of Hyginus, in the time of Trajan, the soldiers were packed much more closely.

[2] Tac. iv. 2: "Facili Tiberio atque ita prono, ut socium laborum non modo in sermonibus, sed apud Patres et Populum celebraret; colique per theatra et fora effigies ejus, interque principia legionum sineret."

curity; for Drusus was instinctively hostile to him; he had murmured at his pretensions, unveiled his intrigues, and in the petulance of power had even raised his hand against him.[1] The prince had complained that his father, though having a son of his own, had in fact devolved no small portion of the government on a mere alien. Sejanus, he muttered, was regarded by the people as the emperor's actual colleague: the camp of the prætorians was the creation of his caprice for the advancement of his authority; the soldiers had transferred to him their military allegiance, and his image had been openly exhibited as an object of popular interest in the theatre of Pompeius.[2] Moreover he had already contracted an alliance with the family of the Cæsars by the betrothal of his daughter to a son of Claudius, the surviving brother of Germanicus.[3] But Drusus was married to a weak and vain woman, whom Sejanus, by affecting a violent passion for her, had succeeded in seducing and attaching vehemently to his interests. Divorcing, as the first step in his designs, his own consort, Apicata, he had extended to Livilla the prospect of marriage with himself, and therewith of a share in the empire to which she encouraged him to aspire. Such at least was the story which was long afterwards revealed by the confessions of their slaves under torture; a story of little value, perhaps, except as displaying the current of popular opinion; for the wife of Drusus, it might be supposed, was already nearer to the throne than the paramour of Sejanus. Probably the unfortunate woman consulted no other

[1] Tac. *Ann.* iv. 3. [2] Tac. *Ann.* iv. 7.

[3] Tac. *Ann.* iii. 29.: "Adversis animis acceptum quod filio Claudii socer Sejanus destinaretur." This marriage did not take effect, Drusus, the son of Claudius, dying by a singular accident while yet a child, a few days after the betrothal. Suet. *Claud.* 27.: "Drusum Pompeiis impuberem amisit piro, per lusum in sublime jacto et hiatu oris excepto, strangulatum; cui et ante paucos dies filiam Sejani despondisset." Dion, lx. 32.

tempter than her own passion, and was persuaded to listen to his solicitations for the removal of the obstacle between them.[1] With the help of a confidential physician and a corrupt slave, they contrived, after many delays, to administer poison to the prince, of which he lingered long enough to give his decline the appearance of a casual sickness, brought on, as some imagined, by intemperance.[2]

Firmness, real or affected, of Tiberius at this loss.

The loss of the unfortunate son of Tiberius seems to have been attended with none of those passionate regrets which have thrown a mournful interest over the decease of his nephew. The family of the popular favourite seemed, on the contrary, to gain fresh lustre from the disaster which thus befell the rival branch of the imperial house. No suspicion was aroused, no inquiry at least was made into the cause of the young Cæsar's death. The image of antique fortitude which Tiberius pretended to present caused some curious remarks, but little admiration, among the soft impulsive people, who had long cast aside the iron mask of their ancient discipline. Entering the senate, where the consuls, in sign of public mourning, had relinquished their place of honour, and were sitting promiscuously on the common benches of the senators,

[1] Tac. *Ann.* iv. 8.: "Sejanus, maturandum ratus, deligit venenum, quo paulatim irrepente, fortuitus morbus adsimularetur: id Druso datum per Lygdum spadonem, ut octo post annos cognitum est." Another version of the story, which Tacitus cannot refrain from repeating, though he acknowledges how little it deserved credit, was, that Sejanus contrived to poison the cup which Drusus was about to present to his father, and warned Tiberius not to accept it: whereupon Drusus, having no suspicion of the fraud, and anxious in his innocence to avert suspicion, himself swallowed the draught. Tiberius, however, was persuaded that he committed the suicide in despair of being discovered. Tac. *Ann.* iv. 10. Such were the fantastic horrors which obtained credence among the citizens, and such wild credulity is perhaps the strongest evidence of their fears and sufferings.

[2] This was the cause, according to Suetonius (*Tib.* 62.), to which Tiberius himself was induced to attribute it.

he bade them resume their curule chairs, and declared that for himself, he found his only consolation in the performance, more strict than ever, of his public duties. Tearing himself from the corpse of his child and the embraces of his family, he rushed, with redoubled devotion, into the affairs of the republic. He lamented the extreme age of his mother Livia, his own declining years, now deprived of the support of sons and nephews, and asked leave to recommend to the fathers the last survivors of his hopes, the youthful children of Germanicus. The consuls sprang to their feet, and left the room to conduct the young Nero and Drusus into the assembly. They placed them before the emperor, who taking them by the hand exclaimed: *These orphans I placed under the protection of their uncle, entreating him to regard them as his own. Now that he too is dead, I turn to you, fathers, and adjure you by the gods of our country to receive, cherish, and direct these great grand-children of Augustus.* Then turning to the young men he added: *Nero and Drusus, behold your parents: in the station to which you have been born, your good and evil are the good and evil of the state.*[1]

The Romans ridicule Tiberius's pretended offer to restore the republic.

In betraying the hollowness of his conduct to a generation keenly alive to an overacted hypocrisy, Tiberius showed how little he comprehended the character of the times. Augustus might repeat the farce of pretending to restore the Republic; but when the second princeps now proposed, in the fulness of his simulated affliction, to imitate this magnanimity, every feeling of compassion for the loss he deplored and of admiration for his fortitude was overwhelmed by a sense of ridicule. It was a relief to both parties to

[1] Tac. *Ann.* iv. 8.: "Ita nati estis ut bona malaque vestra ad rem publicam pertineant."

divert their thoughts with the splendid pageant of a funeral, in which the long line of heroes of the Julian and Claudian houses, from Æneas and the Alban kings on the one side, from Clausus, the Sabine chieftain, on the other, was represented by their genuine or imaginary effigies. Even while Tiberius was pronouncing the expected eulogy on the virtues of the deceased, Sejanus, attending at his side, might be emboldened, by the coolness with which the citizens received it, to plan the completion of his schemes by a series of fresh atrocities. The brave Agrippina was not of a character to be corrupted like the weak Livilla: her virtue was invincible, and her vigilance never slept in guarding her children from the perils that environed them. But the circumstances of her bereavement, and the favour which had been extended to her enemy Plancina, had left a fatal impression on her mind. With a rooted distrust of the emperor she joined a bold and no doubt a fierce and violent spirit. Like a true Roman she exercised without fear or shame the national licence of the tongue, and in a court where no whisper was not repeated, proclaimed aloud to every listener the wrongs of which she deemed herself the victim.[1] The fertility with which her marriage had been blest had been long a source of jealousy to the morbid self-love of the empress-mother, which even in extreme age, and though her son had reached the summit of her wishes, was piqued by the maternal taunts of this Niobe of the palace.[2] The court was filled with spies and intriguers, encouraged by Sejanus, with the assurance of favour from the emperor himself, to place the worst construction on her words and actions, and to entice her by insidious artifices to utter every sentiment of pride and impatience. To the suspicion that he was hostile at

The masculine virtues of Agrippina.

[1] Tertull. *Apol.* 25.: "Illa lingua Romana." [2] Tac. *Ann.* iv. 12.

heart to his nephew's family, Tiberius gave perhaps some colour by the moroseness with which he repelled the compliment to them, by which some of his least wary courtiers now sought to gratify him. When the priests directed that vows should be offered for the health of the princeps himself, conjoining therewith the names of Nero and Drusus, he rebuked them impatiently for their unseasonable officiousness. But with his usual maladroitness, the terms he used were such as seemed to imply a feeling of jealousy towards the young men. He complained that to join them with himself in this prayer for the imperial family was to make as much of their health, young and vigorous as they were, as of the grave infirmity of years under which he felt himself to labour. *Did you this,* he peevishly added, *at the request of Agrippina, or were you moved to it by her menaces?* When they protested warmly against either imputation, he recollected himself, and confined himself to a moderate rebuke, at the same time desiring the senate to abstain henceforth from exciting a giddy ambition by premature distinctions.[1] Sejanus followed in his master's key, and declared his alarm lest the state should be split into factions by the partisans of Agrippina and her children. He even recommended measures for reducing the influence of certain nobles who had shown most alacrity in serving them. Tiberius, sore and vexed with himself and all about him, acquiesced in every counsel his only favourite administered to him: he showed his ill-humour by a captiousness which could never refrain from bitter speeches even on the most trifling occasions. Disregard and sympathy seemed to be equally distasteful to him. When the citizens of Ilium sent envoys to condole with him on the death of Drusus, a deputation which could not

Tiberius apparently jealous of the family of Germanicus.

[1] Tac. *Ann.* iv. 17.

reach him till some months after the event, he condoled with them in return for the loss of their excellent townsman Hector.[1]

The year 776, the ninth of Tiberius, is marked by Tacitus as the turning point in the character of the second principate. Up to this time the government, he affirms, had been conducted with honour and advantage to the commonwealth; and thus far the emperor, he adds, might fairly plume himself on his domestic felicity, *for the death of Germanicus he reckoned among his blessings, rather than his afflictions.* From that period, however, fortune began to waver: sorrows and disappointments harassed him and soured his temper; he became cruel himself, and he stimulated cruelty in others.[2] The mover and contriver of the atrocities which followed, it was allowed on all hands, was the wretched Sejanus. Their instruments were the corrupt and profligate courtiers, who pressed forward to earn the rewards of delation, and soon outstripped by their assiduity even the ardour of Sejanus himself. While the intrigues of the aspiring favourite were directed against the friends and allies of the family of Germanicus, Tiberius was perhaps unconscious, in his retirement, of the secret machinations of the prefect, and seemed to wonder more and more at the zeal of his subjects in hunting down all whom they presumed to be his enemies, and bringing them to condign justice. His personal fears, and by this time the selfishness of his character had degenerated into excessive timidity, were constantly excited by the pretended discovery of plots against him. The wife of Silius, the pacifier of Gaul, was a friend of Agrippina: her husband accordingly was marked out for the first

Deterioration of the principate of Tiberius from the year 776.

Fate of C. Silius. A. D. 24. A. U. 777.

[1] Suet. *Tib.* 25.

[2] Tac. *Ann.* iv. 1.: "Cum repente turbare fortuna cœpit; sævire ipse aut sævientibus vires præbere."

victim, and accused of the gravest crimes against the state.[1] It was affirmed that he had connived at the ripening projects of Sacrovir, instead of crushing the conspiracy in the germ: even when victorious, his triumph, it was insinuated, was sullied by selfish cupidity, and the faithful subjects of the empire had been made to groan under exactions which should have been confined to those who had joined in the rebellion. Such, it was said, were the vehemence and pertinacity with which these charges were pressed upon him, that despairing of his defence, he anticipated the inevitable sentence by a voluntary death.[2] He was not perhaps wholly innocent. But his wife, moreover, was driven into banishment; and the emperor's appetite for prosecution was at length whetted, to the great satisfaction of the delators, by the rich plunder which he was persuaded to taste. The treasures which Silius was convicted of having extorted from the provincials were in no case restored to them. Among the throng of courtiers who sought to gratify the government by enhancing the penalties of the condemned, the only course which remained for the best and wisest senators was to mitigate indirectly the dangers of the accused, by restricting the rewards of delation. M. Lepidus earned distinction in this small but honourable band by the proposal, which was, however, probably ineffectual, that the profits of the accusers should be limited to one-fourth of the culprit's fortune, while the remainder was to be restored to

A. D. 25. A. U. 778.

[1] Tac. *Ann.* iv. 19.

[2] The object of this suicide, a course to which we shall find the accused not unfrequently resort, was the hope of preventing the confiscation of property which would follow upon a judicial sentence. Silius, whatever gains he had acquired in his province, had been enriched by the liberality of Augustus, and in seizing upon his fortune for the fiscus, Tiberius for the first time showed an appetite for personal lucre: "Prima erga pecuniam alienam diligentia." Tac. *Ann.* iv. 20.

his guiltless children. It was deemed worthy of remark, amidst so many instances of servility in the nobles and jealousy in their masters, that such a proposal should have been made at all, and made without being resented. Tacitus, as a disciple of the school of the fatalists, of which the language at least was fashionable in his day, is constrained on this occasion to inquire whether the favour or hostility of princes is a matter of mere chance and destiny, or whether there may not still be room for prudent counsel and good sense in the conduct of human affairs; whether a secure path of life, however hard to trace, might not still be discovered amidst the perils of the times, between the extremes of rude independence and base servility.[1] The great defect of the Romans at this period lay in their want of the true self-respect which is engendered by the consciousness of sober consistency. Bred in the speculative maxims of Greek and Roman republicanism, they passed their manhood either in unlearning the lessons of the schools, or in exaggerating them in a spirit of senseless defiance.

Prosecution and suicide of Cremutius Cordus.

Silius, it would seem, had laid himself open to the attacks of the informers, and there were others against whom the favourite's intrigues were directed, whose public crimes or personal vices had alienated from them the compassion of the citizens. Nevertheless another of his victims seems to have been a man of real merit, though not of such a description as to engage for him a great amount of popular sympathy. Cremutius Cordus, a follower of the Stoic philosophy, had composed the Annals of the Roman Commonwealth during the period of the Civil Wars. He had praised the pa-

[1] Tac. *Ann.* iv. 20.: "Unde dubitare cogor fato et sorte nascendi, ut cætera, ita Principum inclinatio in hos, offensio in illos: an sit aliquid in nostris consiliis, liceatque inter abruptam contumaciam et deforme obsequium pergere iter periculis et metu vacuum."

triotism of Brutus, and had called Cassius *the last of the Romans*, a phrase which, under the circumstances of the time, was not a mere speculative inquiry, but a pungent incentive to violence. Augustus, indeed, had actually perused the volume, and though he found in it no panegyric on himself, did not complain of it as disloyal or dangerous. But Augustus was strong in the affections of his people, and could afford to disregard the sophisms of the most vehement of declaimers. Tiberius was far from sharing the confidence of his predecessor. He felt or fancied every moment that he felt his throne tottering; but this very sense of weakness induced him to abstain from any act which might arouse the people from the lethargy into which they had fallen. It was not till the conduct of affairs came into the hands of a minister with personal ends to serve, that such experiments were made on the general patience, as the prosecution of a respectable citizen, like Cremutius, for the expression of a political opinion. The accusers were clients of Sejanus, and though we know not what was the special object of the favourite's hostility, we may suppose that the philosopher was known as a partisan of Agrippina. Whatever, however, was his real crime, the charge against him was that of exciting the citizens to rebellion; a charge which no judge in modern times could deem to be rebutted by the reply that the ostensible objects of his praise had been dead seventy years. To urge as an argument that Augustus had tolerated his language a little while before was merely trifling; every government must judge of the licence that may be granted to hostile criticism, and the circumstances of the later period were essentially different from those of the earlier. But the victim of Sejanus had no security for a fair trial, a reasonable hearing, or a temperate sentence. He provoked his judges and aggravated his offence by anticipating injustice by violence.

Cremutius, now an old man, having delivered himself of a speech, such perhaps as Tacitus ascribes to him, full of bitter invective against the government and the times, went home without awaiting the proceedings with which he was threatened, and put an end to his own life by starvation. His books were ordered to be burnt; but some copies of them were preserved, and all the more diligently studied by the few who had secreted them.[1]

Tiberius interferes to check the delators.

It must be remembered that in the peculiar position of Tiberius, policy required him to give wide scope to individual action in matters that did not immediately concern his own power and security. For the persecution of citizens by citizens he was not at least legally responsible: and it was one of those shadows of liberty which he was careful in conceding, to allow his subjects the gratification of their private enmities before the ordinary tribunals. The peculiar constitution of the Roman legal procedure, which permitted and indeed urged every citizen to assume the character of a public prosecutor, served to exonerate the chief of the state, in the view of his own countrymen, from a large portion of the odium which later ages have cast upon him. At the same time the firmness he occasionally exhibited, in spontaneously interposing to check the licentiousness of his people, was regarded by the citizens as a token of extraordinary consideration, and continued to secure him, among so many motives they had for disliking him, no small share of their respect and even favour. Thus, when Plautius Sylvanus, a prætor, was hurried before him, on the charge of having murdered his wife, and pleaded that she had, unknown to him, laid violent hands on herself, he marched direct to the chamber

[1] Tac. *Ann.* iv. 34, 35. Comp. Suet. *Tib.* 61.; *Calig.* 16.; Dion, lvii. 24.; Senec. *Consol. ad Marc.* 1. 22.

of the accused, and satisfied himself by personal examination of the unquestionable signs it exhibited of a struggle and murder. Such vigour and presence of mind could not fail to make a favourable impression on the multitude.[1] When Salvianus brought a charge against a noble citizen on the day of the Latin Feriæ, he resented the desecration of that holy season, and caused the intemperate accuser to be himself banished.[2] Again, when Serenus was condemned for seditious intrigues, on the accusation of his unnatural son, and the senate proceeded without hesitation to sentence him to death, Tiberius interposed to annul the degree, and desired his precipitate judges to pass a second vote. Hereupon Asinius Gallus proposed that, instead of death, the criminal should be relegated to the isle of Gyarus or Donusa; and again Tiberius, observing that those barren rocks were destitute even of water, declared that where life was conceded the necessaries of life ought not to be withheld.[3] In the case of a knight named Cominius, who had been condemned for the publication of libellous verses against himself, he extended to the convicted criminal a free pardon.[4] Such instances of lenity might contrast favourably with the relentless ferocity of the nobles towards one another; they allowed the citizens still to believe that in the dangerous times on which they had fallen, their best protection lay in the chief of the commonwealth, elevated by his station above the ordinary passions of the envious

[1] Tac. *Ann.* iv. 22., A.U. 777.

[2] Tac. *Ann.* iv. 36., A.U. 778.

[3] Tac. *Ann.* iv. 30. The treatment of the exiles seems generally to have been sufficiently mild. They seem to have been allowed to a great extent the choice of their island; and when Augustus forbade them to settle at any spot within fifty miles of the continent, he excepted the pleasant retreats of Cos, Rhodes, and Lesbos. He also confined them to a single vessel of a thousand amphoræ and two pinnaces for the voyage and conveyance of their families, which further were limited to twenty slaves or freedmen. Dion, lvi. 27.

[4] Tac. *Ann.* iv. 31., A.U. 777.

and malignant among themselves. They were full of gratitude to him also for the good fortune which seemed to attend on his public administration. He had been enabled to suppress, by a happy accident, an alarming insurrection of slaves in Apulia, the nurse of servile seditions.[1] The year 777 had witnessed the final pacification of Africa.[2] While the emperor, out of compliment perhaps to the success attributed to Blæsus, had imprudently withdrawn a large part of the forces in the province, and encouraged the restless Tacfarinas to renew his attempts in that quarter, the gallantry of the new proconsul Dolabella had sufficed to bring the enemy to bay, to overpower and reduce him to self-destruction. The citizens rejoiced at this consummation of a tedious and expensive warfare, which had sometimes threatened their supplies, and were proud at beholding an embassy from the remote Garamantes, which came to solicit their clemency. Such, however, was the influence of Sejanus that Tiberius refused the triumphal ornaments to the victor, in order not to dim the lustre of the honours already accorded to the favourite's uncle.[3] But in the provinces, where the genuine merits of the emperor were known without those drawbacks which were but too notorious at Rome, his popularity was perhaps unalloyed. When he insisted on referring to the senate the charge of malversation, which the people of Asia brought against his procurator, and the fathers, thus encouraged, ventured to condemn the culprit, the grateful provincials decreed a temple to Tiberius in conjunction with Livia and the Senate of Rome. This example was about to be followed by the people of

The Romans acknowledge the good fortune of his administration.

[1] Tac. *Ann.* iv. 27., A.U. 777.

[2] Tac. *Ann.* iv. 23.: "Is demum annus populum Romanum longo adversum Numidam Tacfarinatem bello absolvit."

[3] Tac. *Ann.* iv. 26.

Further Spain: but on this occasion the emperor declined the honour; an act of modesty for which he acquired little credit, at least among his own countrymen, who regarded it as pusillanimous and mean. *The best of mortals*, they complacently urged, *had ever aspired to the highest distinctions; thus Hercules and Bacchus among the Greeks, and Quirinus among the Romans, had sought and gained a place among the gods of Olympus: Augustus had lived a hero's life in the hopes of such an apotheosis. Princes*, they said, *may command the present, but it should be their dearest ambition thus to take pledges for the future; indifference to fame is in fact a disregard of virtue.*[1]

Sejanus demands of Tiberius the hand of Livilla.

At the extraordinary elevation to which he had now arrived, the head of the favourite began to whirl, and to his fevered imagination the utmost objects of his ambition seemed almost within reach. Once admitted within the pale of the Cæsarean family, there would be no distinction, divine or human, which he might not expect to fall on him. The last and most arduous step yet to be effected by his own happy boldness, was to secure his entrance therein by marriage with the widow of Drusus. If he had any hesitation at the last moment in taking the plunge which must mar his fortunes, if it failed to make them, the instances of Livilla herself, the partner of his guilt and the depositary of his secret, could not safely be disregarded; the impatience of the woman overcame the last lingering scruples of his discretion. Sejanus composed an address to the emperor; for Tiberius, shy and ever fearful of committing himself, had now adopted the custom, most foreign to the free-spoken habits of the Roman nobles, of requiring every suit to be made to him in writing. *The favour of Au-*

[1] Tac. *Ann.* iv. 38.: "Contemptu famæ contemni virtutes."

gustus, urged the suitor, *in the first instance, and latterly the many tokens of approbation he had received from his successor, had taught him ever to confide his wishes to the ears of the prince, even before disclosing them to the immortal gods. For splendid honours he had never sued; to watch and toil in the ranks for the safety of his imperator was his privilege and pleasure. Nevertheless he had attained the fairest of all distinctions, in being associated in many public functions with the Cæsar himself. This was the foundation of his present hopes. Augustus, he had heard, in seeking to establish his daughter, had deigned to review the order of Roman knighthood. Were a husband now required for Livilla, would not Tiberius cast his eye upon a friend, one pledged to be content with the glory of such a connexion, and never to renounce the laborious duties already laid upon him. For his own part, he should be amply satisfied with the security he should thus obtain against the malice of Agrippina, and that for his children's sake, not for his own: for himself it was enough, and more than enough, to have lived so long in the intimacy of a prince so illustrious.*

Tiberius, on receiving this application, which appears to have been wholly unlooked for, penned a hasty answer at the moment, in which he praised the regard Sejanus had ever shown him and referred slightly to the favours with which he had, on his own part, requited it. *He desired*, he said, *a short time to consider the matter more fully*; and finally replied, *that, while other men were permitted to look solely to their own advantage, princes in all affairs of moment must have regard to the opinion of the world. Accordingly*, he continued, *he would not resort to the answer which lay easiest and nearest at hand—namely, that it was for Livilla herself to determine whether, after Drusus, she*

His suit is rejected.

would wed another, or continue to bear her adverse fortune under the roof of her father-in-law; further, that she had a mother and a grandmother, advisers nearer than himself; — no, he would act more straightforwardly, and represent in person to his friend the objections which really militated against his suit. The passions of Agrippina, he would remind him, would unquestionably break out more vehemently than ever, if the marriage of Livilla should sever the imperial family; the rivalry of the women of Cæsar's house would undermine the fortunes of his children. Sejanus, he added, *was deceived if he imagined that it was possible for him to remain in his present modest rank. Once wedded to a Caius Cæsar, and again to a Drusus, his new wife would never deign to end her career in alliance with a simple knight. Could the emperor himself permit it, did he think that the Roman people would endure it, who had witnessed her brother, her father, and their noble ancestors all crowned successively with the highest honours of the state? Was it true that Augustus had for a moment contemplated the union of his daughter with the knight Proculeius, yet to whom did he actually espouse her?—first, to the illustrious Agrippa, and secondly, to Tiberius himself, to the man, in short, whom he had destined for his successor.* But in saying this the emperor felt that he touched on delicate ground. Sejanus was too useful to be discarded, too formidable to be driven to despair, and he dared not directly cut off from him even the audacious hope of association in the empire, or of succession to it. Accordingly he concluded with fair words, hinting that he had yet more important confidences in store for the friend of his bosom, and that no distinction was in fact too great for his transcendent merits, when the proper time should arrive for worthily acknowledging them.[1]

[1] Tac. *Ann.* iv. 39, 40.

If such was the language Tiberius really held, I see no reason to doubt its sincerity. It was his habit to provide for present exigencies by any artifice that offered, but to leave the more distant future to circumstances. I do not imagine that he had formed at this period any deliberate intention of thwarting the ambitious views of his favourite, or had destined any one of his own kindred to the succession. But he shrank with a selfish instinct from encouraging in any quarter hopes which might get beyond his control, and again, he was alarmed at the consequences of too abruptly quashing them; so that between the one apprehension and the other, his whole study was to keep the presumptions of those around him in a state of perpetual suspense. This was the Tiberian scheme of policy. Let those who describe Tiberius as a man of consummate ability and penetrating genius, represent it, if they can, as something eminently deep and subtle: to me it seems to bear the impress of great moral infirmity, while its execution was as clumsy as its conception was feeble. It may be questioned, however, whether this occurrence, the account of which I have taken, with all other historians, from Tacitus, is after all correctly represented. Sejanus, we are given to understand, was too well versed in courts, and familiar with the forms of an official refusal, to retain after receiving this answer any portion of his hopes: he regarded it, further, as the token of a settled enmity and design for disgracing him. Yet it would seem, in point of fact, that even after this rebuff he was not forbidden to cherish still his brilliant anticipations, and that at a later period Livilla was suffered to enter at least into betrothal with him.[1] Nor, accord-

Alarm and renewed intrigues of Sejanus.

[1] Dion (lviii. 7.) calls her afterwards his μελλόνυμφος, which seems to imply her being actually betrothed; and we can put no less definite meaning certainly on the phrase *gener*, which is applied to him in the fragment, obscure and corrupt it is true, of Tac. *Ann.* v. 6. I am

ing to the statements of Tacitus himself, did he exhibit at the time any signs of despair. He proceeded without a pause to repair the broken meshes of his intrigues; and while he postponed, at least for the moment, his views of an imperial alliance, he revolved new plans for making doubly sure the impending ruin of his rival Agrippina. But he was anxious to remove the emperor from the constant sight of the pomp with which he continued to surround himself, of the crowds that haunted his levees, and proclaimed aloud that he was the real fountain of all imperial favour: on the one hand he feared the jealousy of his master; on the other, it was hardly less dangerous for the favourite to waive the importunate admiration of sycophants and courtiers. To divert the one and yet retain the other, one means only presented itself, namely, to induce the emperor to quit the arena of public life, and bury himself in a distant retreat, whence all his orders would pass through the hands of the minister.[1] The immediate attendants of the imperator were properly his centurions and tribunes; these were the sentinels at his chamber-door, the companions of his daily exercises; by their hands every letter to the consuls or senators would be conveyed: and Sejanus, as captain of the prætorians, and the source of favour and promotion among them, could thus keep close watch upon the correspondence of his chief, as soon as he should have debarred him from personal intercourse with the citizens.

The repeated excursions Tiberius had now made from Rome, and his long-continued cessations from the irksome routine of residence in the city, had confirmed his inclination for indolence and retirement;

compelled to suspect that Tacitus has sacrificed the truth to introduce this interesting dramatic interlude.

[1] Tac. *Ann.* iv. 41.: "Sejanus non jam de matrimonio, sed altius metuens . . . . huc flexit ut Tiberium ad vitam procul Roma amœnis locis degendam impelleret. Multa quippe providebat . . . ."

nor was there any difficulty in persuading him that his increasing infirmities demanded repose, after so many years of labour. But before he betook himself to the retreat he had perhaps long contemplated for his old age, some striking scenes of anger and recrimination occurred between him and Agrippina, which confirmed and exasperated whatever ill feelings subsisted between them. Among the attacks and insults which were hazarded against the wretched princess by the suitors for the favour of Sejanus, was the prosecution of her cousin Claudia Pulchra by a noble delator, on a charge of adultery combined with majesty.[1] It was affirmed that she had sought to employ poison against the emperor's life, as well as the more subtle influence of charms and incantations. When the trial came on, Agrippina rushed into the emperor's presence, at a moment when he was in the act of sacrificing to his father's divinity. *Should the same man*, she exclaimed, *offer victims to Augustus, and also persecute his children?* To this blunt address she added a shower of invectives against him, together with vehement protestations of her kinswoman's innocence. Forgetting for once, under this unexpected attack, the pertinacious reserve in which he was wont to wrap himself, Tiberius at last broke silence with a Greek quotation, implying, *Must I be denounced as a tyrant because you are not a queen?*[2] Rebuffed by this cold sarcasm, Agrippina retired hastily to her chamber, and flung herself on

Quarrel between Tiberius and Agrippina. A. D. 26. A. U. 779.

[1] Lipsius cannot trace the origin of this Claudia, or her affinity with Agrippina. She is called her *sobrina*, i. e. cousin by the mother's side; and from her name I conceive that she was descended from the Claudia, daughter of P. Clodius Pulcher, to whom Augustus was originally affianced, and whose husband is not known. Her only real connexion with the imperial family lay in the union of her son Quintilius Varus with a daughter of Agrippina and Germanicus.

[2] Tac. *Ann.* iv. 52.: "Correptamque Græco versu admonuit: non ideo lædi quia non regnaret."

her couch, where rage and mortification, combined with the news of Claudia's condemnation, threw her into a dangerous fever. When Tiberius visited her sick-room, the poor creature's spirit was so much broken, that she burst into tears, and implored him to take pity on her solitary state by giving her a husband to support and defend her. She was still young, she said, and might become again a mother, and brought up in all the dignity of Roman matronhood, she could find no solace except in a lawful husband. There were many nobles, she remarked, who would proudly assume the right of protecting the widow and children of Germanicus. Tiberius, thus abruptly solicited on a point which deeply concerned his policy, might have replied in nearly the same terms as those he had addressed to Sejanus: his duty to the state, as Tacitus himself allows, would not suffer him to countenance a request which must issue in fresh jealousies and enmities between the members of the imperial family. But he did not choose to reveal to an impatient woman the apprehensions to which the accomplishment of her wishes would subject him, or make the humiliating confession that he could not venture in all respects to follow the exalted policy of Augustus: lest he should give an opening for inconvenient discussion, he left her, in his awkward way, without speaking a word. The scene which thus passed in the recesses of the palace was not generally disclosed, but was recorded in her private memoirs by the daughter of Agrippina herself, a personage of whom I shall have much to relate hereafter.[1]

[1] Tac. *Ann.* iv. 53.: "Quæ Neronis principis mater vitam suam et casus suorum posteris memoravit." It is natural to surmise that the revelations of the palace which our historians relate, are derived in a great measure from these family memoirs, and it is impossible to overlook the probability that the conduct both of Tiberius and Sejanus would be seriously misrepresented by an hereditary enemy to both.

In the height of her distress, and when the vexations of her position had thrown her more than ever off her guard, Sejanus contrived to instil fresh and yet more shocking suspicions into the mind of the unfortunate princess, which served only to complete the disgust and alienation of Tiberius. The minister's creatures ventured, under the guise of friendly care for her, to insinuate that her uncle was seeking an opportunity of poisoning her, and enjoined her to avoid partaking of food at his table. The widow of Germanicus was residing under the roof of the head of the Cæsarean family: there were no separate establishments for princes or princesses of the blood imperial; but it was only on special occasions, perhaps, that the emperor invited the females of his house to sup in company with him. Agrippina had neither the temper nor the art to dissemble. Reclining by the side of her host, she rejected every dish presented to her with cold and impassive mien, and without excuse or observation. Tiberius could not fail to remark her behaviour, nor to guess its motive. To assure himself, he offered her some apples with his own hand, recommending their flavour; but she, all the more confirmed in her suspicions, handed them untasted to the attendants. Hereupon Tiberius turned to his mother on the other side, and muttered that none could wonder at any show of harshness in his conduct towards one who scrupled not to intimate her apprehensions of his intent to poison her. The incident was speedily noised abroad, and the rumour prevailed that he was actually meditating her destruction, and, not daring to effect it by public process before the face of the citizens, was contriving secret means of assassination.[1]

Suspicions against Tiberius instilled into the mind of Agrippina.

At a later period I shall have occasion to show more particularly how another history appears to have been vitiated by the same writer's unscrupulous malice.

[1] Tac. *Ann.* iv. 54.

Informed by his spies of the whispers thus circulating among his subjects, Tiberius was annoyed, if not seriously alarmed. He tried to give another current to men's thoughts, and directed their attention to the curious rivalry now presented by eleven chief communities of the province of Asia, each of which sought to approve itself the worthiest claimant for the honour of erecting a temple to Rome and her glorious imperator. The pretensions they severally advanced were all nearly similar, appealing to the splendour of their mythological origin, as founded by some Jove-descended hero, to their connexion with Troy, the reputed parent of Rome herself, or to their well-attested fidelity to their conquerors. The claims of Hypæpe, Tralles, Laodicea, Magnesia, Pergamus, Ephesus, Sardis, and others, were heard successively; but all were finally postponed to those of Smyrna, whose people had crowned their merits towards the Republic by stripping the raiment from their own backs to supply the necessities of Sulla's army. Tiberius attended in the senate throughout these discussions, which were protracted for several days, and showed himself more busy and active in public matters than had been usual with him for some time past.[1] Nevertheless, he had been long meditating a final retirement from Rome; and the increasing suspicions and even offensive remarks of the citizens tended no doubt to ripen this resolution. Five years before he had allowed himself to be absent for a whole twelvemonth in Campania: he now sought the same retreat once more; but this time he probably determined in his own mind never again to return. The motives of this determination were variously assigned by the ancients, and it is probable

Eleven cities of Asia contend for the honour of making Tiberius their tutelar divinity.

[1] Tac. *Ann.* iv. 55, 56. That the temple was to be specially dedicated to Tiberius, though not mentioned in this place, appears by comparing it with cc. 15. 37.

that more than one combined to produce a resolution so important. We may believe that it was at least partly owing to the influence of Sejanus, who desired, as has been before observed, to withdraw his jealous master from the daily sight of his favourite's undue preeminence. It is possible also that Tiberius may have been anxious to escape from the dominion his mother still continued to exercise over him; for he was conscious that he owed the empire to her influence over Augustus, or so at least she was herself firmly persuaded, and never allowed him to forget it. It seems probable, however, that he was thus driven into solitude by the infirmity of his own temper; by his dislike of the show and trappings of public life; by the shyness which was natural to him, and which had been undoubtedly increased to a morbid degree by the long and painful solitude of his banishment at Rhodes. As he grew older he seemed more to lose his presence of mind in public; and if sometimes a senator broke out into invectives against him, or assailed him with unseasonable questions, he became confused and agitated. His temper was exasperated by the imputations made or insinuated against him, and the charge of severity in his judgment on criminals piqued him to actual ferocity, which afterwards all the more distressed and alarmed him.[1] For this retirement he had been, as we have seen, a long time preparing, and the motives which now impelled him to it were, we may suppose, the same which had long been familiar to his thoughts, to which increasing years had given strength and poignancy. The bitterest of his enemies, however, declared that he had no other wish than to exercise in secret the cruelty and

Tiberius meditates retiring from the city.

Motives ascribed to him.

[1] Compare particularly the story in Tac. *Ann.* iv. 42.: "Cæsar objectam sibi adversus reos inclementiam eo pervicacius amplexus."

atrocious lewdness to which, they asserted, he was utterly abandoned; or that he was ashamed of exhibiting to the public gaze the ungraceful leanness of his bent and shrivelled figure, the baldness of his forehead, and a face deformed by spots and pimples, or the patches with which he concealed them.[1] We have already seen reason for questioning the habitual intemperance and dissoluteness of Tiberius, to which such disfigurements as these were popularly imputed; but the prejudice against him was deeply rooted in the minds of the Romans, and was confirmed by repeated stories of the blackest colour, and the disgust at the horrid monster expressed, it was said, by every woman to whom he made his loathsome advances.

Tiberius quits Rome.

The immediate pretext for quitting Rome was the object of dedicating temples recently erected to Jupiter at Capua, and to Augustus at Nola, the spot from whence the late emperor had ascended into the heavens.[2] It was in the year 779 that Tiberius slunk, as it were, out of the city, with only a single senator, named Cocceius Nerva, in attendance upon him, nor, besides Sejanus himself, more than one knight.[3] The rest of his retinue was composed of a few men of learning, chiefly Greeks, and some of them, no doubt, astrologers. The departure of the chief of the state from the centre of government, except to command armies abroad, or during the recess of business allowed in the summer heats, had been so unusual, that, while the emperor's real intentions were still confined to his own bosom, the vulgar were busy in conjecturing the result, and the searchers of the heavens, ever faithful interpreters of the popular instinct, whispered that their art revealed to them that he was destined never to return.

[1] Tac. *Ann.* iv. 57.: "Erant qui crederent in senectute corporis quoque habitum pudori fuisse." He was now (A. U. 779) in his sixty-seventh year. "Traditur etiam matris impotentia extrusum."

[2] Suet. *Tib.* 45.

[3] Tac. *l. c.*

It was dangerous to give publicity to such surmises, which the sanguine and impatient shaped readily into the assurance that his death was at hand, and so brought many into trouble on the charge of anticipating the prince's decease.[1] The conjecture, indeed, proved literally correct, though not in the way that was anticipated. Tiberius never again entered Rome: but no man, says Tacitus, could have imagined that a Roman would voluntarily abandon his country for a period of eleven years.

What the Romans meant by "patria carere," abandoning one's country.

Harsh, indeed, and unreal the historian's phrase may appear to our notions, *to abandon one's country*, or, more strongly still, *to exist without a country*, thus applied to a citizen quitting the walls of Rome to reside in a suburban retreat on the coast of Campania.[2] Doubtless we may trace in it something of an affectation of antique sentiment, from which Tacitus is by no means always exempt, not strictly in accordance with the genuine feelings of the time. We have seen, indeed, how deeply Cicero was moved at the thought of quitting the neighbourhood of his beloved city. His sensibility was more acute than other men's, but it only pointed in the same direction as theirs. The levity of Milo on the occasion of his banishment caused, perhaps, some revulsion in the sympathy of his party with him. Even in the camp of Pompeius the fugitive patriots could scarcely retain their assurance that they were still genuine Romans.[3] But we have seen how desperate was

[1] Tac. *Ann.* iv. 58.: "Ferebant periti cœlestium, iis motibus siderum excessisse Roma Tiberium ut reditus illi negaretur; unde exitii causa multis fuit, properum finem vitæ conjectantibus vulgantibusque."

[2] Tac. *Ann.* iv. 58.: "Ut libens patria careret."

[3] The arguments of Lucan against this sentiment are not uninstructive. *Pharsal.* v. 26.: "Rerum nos summa sequetur
Imperiumque comes . . . . non unquam perdidit ordo
Mutato sua jura solo . . . .
Ordine de tanto quisquis non exsulat, hic est."

Cicero's affliction at being exiled beyond the seas; how loath he was to follow the self-expatriated consuls; how anxious at the first moment to make his peace with the conqueror and return; how, in the last crisis of his fortunes, the imminent perils of his post at Rome could not induce him finally to desert it. Cicero would have been hardly less unhappy in a Campanian retirement than in Greece or Macedonia, if doomed irrevocably to sojourn among its foreign associations; for in this respect the change from Rome to Naples was hardly less complete than that to Rhodes or Athens. The Greek cities of Campania were, as we have seen before, in almost every particular, accurate and vivid copies of those beyond the sea: their foreign manners and habits, attractive as they were to the world-worn seeker for amusement and relaxation, were reputed by every true Roman altogether unworthy of his constant adoption. Rome was the proper sphere of his business and duty, the shrine of the gods, the sacred soil of the auspices, the tribunal of the laws, the stative camp of the warrior nation. There the Roman girded himself for the work of his great moral mission, to spare the subject, but beat down the proud; elsewhere he might loose his robes and put off his sandals, and indulge in recreations, which his conscience, strictly questioned, could scarcely distinguish from vices.[1] *To play the Greek*, for which his vocabulary furnished him with a short expressive term, was in his view pleasant but

[1] Thus Cæsar was reproached as "puer male præcinctus." The loose trailing of his toga in the forum was objected to Mæcenas. Such a want of etiquette was reputed a token of dissoluteness of morals. Suet. *Ner.* 51.: "Adeo pudendus ut . . . . prodierit in publicum sine cinctu et discalceatus." Horat. *Sat.* ii. 1. 71.:

> "Quis ubi se *a vulgo et scena* in secreta remôrant
> Virtus Scipiadæ et mitis sapientia Læli,
> Nugari cum illo et discincti ludere, donec
> Decoqueretur olus, soliti."

wrong[1]: it might be excused in the overwrought statesman, in the exhausted soldier, in the mere thoughtless youth; but only as an exception to the common rule of life and conduct, as a rare holiday breaking the stern routine of daily practice, to which his birth and breeding devoted him. The Roman must live and die in harness. An Atticus renounced with the forms and duties of Roman life most of the rights and privileges of a Roman citizen. As an Athenian burgher he forfeited the franchise of the conquering state; and the exemption he enjoyed from the calamities of the civil war was, in another view, the penalty he paid for the loss of the name of Roman. But assuredly such were not the sentiments of the citizens of the age of Tiberius, still less those of a century later. Life at Rome, while it still retained most of the outward forms of antiquity, the harsh restrictions upon freedom of action and conversation which had been endured by the Scipios and Catos, had lost the charms of political independence, for which alone they had been content to endure them. The Roman noble now chafed at the stiff etiquette of his ancestors; he shrank from the importunate observation of his clients; he loathed the obeisances of his subjects, conscious that he deserved them neither by personal merits, nor substantial power; he rejoiced to escape from a multitude of jealous critics to companions who had no claim to watch or control him, who considered his countenance as a favour, and never paused to reflect whether it was unworthy in him to give, or in themselves to accept it. Still the actual abandonment of the pre-

[1] Hor. *Sat.* ii. 2. 11.:

"Si quem Romana fatigat
Militia assuetum Græcari."

Hence also "græcatus," "græcanicus," applied to the manners of Romans imitated from the Greek. "Græcanicus miles," a dissolute or luxurious soldier. See Facciolati in voc.

scriptive post of duty was rare and remarkable. It was affirmed, for instance, of Lucius Piso, one of the chief magnates of the Tiberian senate, that in his disgust at the proceedings of the delators, he had expressed among his compeers, a determination to withdraw from the city, and therewith from public life altogether. It had been well for him had he actually executed this threat: he had the courage to bring the favourite of the empress to justice, but not to quit the scene of his dangerous activity, and only avoided by the opportuneness of his death the penalty of charges of which he was speedily convicted.[1]

Tiberius does not abandon public affairs.

The retirement of Tiberius himself from the public stage was however in no respect a real relinquishment of public occupation. No one supposed that he would cease thereupon from retaining the supreme oversight of the affairs of the commonwealth; nor, in the existing state of political usage, was there any real impediment to his ruling the empire from his quiet retreat. The undefined character of the supreme authority had this advantage for its possessor, that it bound him to no stated functions, requiring his presence at certain times, at certain places. The consul must take the auspices, and these could be taken only at Rome; a dictator must perform the rites of the Latin Feriæ on the Alban hill; a tribune must not absent himself from the city during the period of his office: but none of these restrictions applied to one who retained the power of all these officers, but was exempt from their restrictions. Even though in theory the safety of the state might be regarded as entwined with the performance of certain religious ceremonies by the chief pontiff, yet from the time at least of Julius

[1] Tac. *Ann.* ii. 34.: "Inter quæ L. Piso ambitum fori, sævitiam oratorum accusationes minitantium, increpans abire se et cedere Urbe, victurum in aliquo abdito et longinquo rure testabatur." Comp. iv. 21. This was not the L. Piso, prefect of the city.

Cæsar, the presence of that august official had been for many years dispensed with, and there was nothing new at least in Tiberius delegating to others, or altogether omitting, duties which his imperial predecessors, and Lepidus in his retreat at Circeii, had been permitted to waive. Nevertheless this act was not without grave significance. Whenever Augustus had withdrawn from the heart of the empire, it was only to impart fresh vigour to the action of its extremities: never for a moment had he resigned his ostensible place as the prime mover of the whole machine, or let his subjects imagine that the wheels of government could continue to revolve by the mere impulse once communicated to them. The retreat to Campania was thus a great step in the development of despotism, the greatest step perhaps of all, inasmuch as it made it at once apparent that the institution of monarchy was an accomplished fact, and no longer the creature of variable popular caprice.

The retirement of Tiberius did not fail, however, to be followed by a succession of public calamities, and these were generally ascribed to so strange and inauspicious a proceeding. A private speculator had undertaken, as a matter of profit, one of the magnificent works which in better times it was the privilege of the chief magistrates or candidates for the highest offices to construct for the sake of glory or influence. In erecting a vast wooden amphitheatre in the suburban city of Fidenæ, he had omitted the necessary precaution of securing a solid foundation; and when the populace of Rome, unaccustomed, from the parsimony of Tiberius, to their favourite spectacles at home, were invited to the diversions of the opening day, which they attended in immense numbers, the mighty mass gave way under the pressure, and covered them in its ruins.

Disastrous occurrences ascribed to the retirement of Tiberius.

Fall of the amphitheatre at Fidenæ.

Fifty thousand persons, or according to a lower computation not less than twenty thousand, men and women of all ranks, were killed or injured by this catastrophe, which called forth an edict from the senate, forbidding any one henceforth to exhibit a gladiatorial show, unless his means were independent and ample, while the rash projector was driven into exile; a mild punishment, perhaps, if it was right to punish him at all. The care and attention lavished on the sufferers by the wealthiest people at Rome, the spontaneous offering of medical care and attendance, served at least to remind the citizens of the best days of the republic, in seasons of public calamity. But this sorrow had not been forgotten when it was redoubled by the disaster of a great fire, which ravaged the whole of the Cælian hill and a considerable area of the city besides, occupied with dwellings of every class. This catastrophe, however, gave Tiberius occasion to exhibit a munificence and consideration for his people, for which he had not yet acquired credit.[1] The senate decreed that the hill should henceforth bear the name of Augustus, in memory of this imperial liberality, and more particularly because, in the midst of the general destruction, an image of the emperor, it was reported, had alone been left standing and unscathed. A similar prodigy had occurred in the case of another personage of the imperial house, the famous Claudia Quinta, whose effigy had twice escaped the flames, and been placed thereupon as a sacred relic in the temple of the Mother of the gods.[2]

Conflagration on the Cælian hill.

But to more intelligent observers these calamities were far less alarming than the steady advance of the toils which were gradually surrounding the family of Germanicus. Though the

Progress of delation.

[1] Vellius, ii. 130.

[2] Tac. *Ann.* iv. 62—64. It is hardly necessary to observe that the new name of the Cælian soon fell into disuse.

charges urged against its members were managed by private delators, none could doubt that Sejanus himself was the mover of the horrid conspiracy. The first approaches against this illustrious house were made cautiously from a distance; it was deemed advisable to sap the outworks of the family in the persons of its remoter connexions, before assailing the citadel, and attacking the mother of the princes and the princes themselves. Domitius Afer, the same who had prosecuted Claudia Pulchra to condemnation, proceeded to advance charges of treason or licentiousness against her son, Quintilius Varus, the husband of one of the daughters of Germanicus.[1] In this odious prosecution he was joined by Dolabella, a kinsman of the unfortunate youth. The conduct of the first caused at least no surprise, for he was poor and delation was his trade; but Dolabella had no such excuse; and when he, highborn and wealthy as he was, stood forward to shed noble blood, the same which flowed in his own veins, the citizens were astonished and indignant. For once the senators ventured to stem the torrent of delation, which Sejanus was evidently directing to his own guilty purposes. They resolved before pronouncing sentence to await the decision of the emperor himself.[2] Such was the state of affairs, under the sway of the favourite and his creatures, that Tiberius was regarded as the last hope and refuge of the oppressed. Possibly, for we hear no more of the result, his interference saved the victim on this occasion. Nevertheless the power of Sejanus, whatever shock his recent rebuff may have given it, was now completely

[1] This Quintilius Varus was the son by Claudia Pulchra of the Varus who perished in Germany. His marriage to a daughter of Agrippina, whose name is not known, is mentioned by M. Seneca, *Controv.* i. 1. 3. It is strange that Tacitus should have omitted to mention this connexion; but we have seen that he was not well informed as to the position of Claudia.

[2] Tac. *Ann.* iv. 66.

re-established. A fortunate accident had enabled him to prove his devotion to the emperor by saving his life at the risk of his own. In the course of an entertainment which Tiberius had held in the cool recess of a grotto in Campania, the roof of the cavern had suddenly given away, and covered the tables and the guests themselves. Sejanus, in the midst of the confusion, had thrown himself across the prostrate body of his master, and bending in the form of an arch, with a great exertion of his herculean strength, had shielded him from the falling fragments.[1] This act of courage had made a great impression on Tiberius, and seemed at least to have obliterated the unfavourable feelings which the late affair between them might have excited.

Renewed favour of Sejanus.

The minister, to whom a double share of the cares of government were now confided, could easily persuade the senators that his influence with his master was quite unbounded, and that no cloud had ever passed over the sunshine in which he basked. He set spies to watch every word and movement of Nero, the eldest child of Agrippina, and suborned the wife and brother of the luckless youth to urge him to indiscretions, and aggravate them by misrepresentation. Such, however, were the young prince's admirable sense and conduct that no handle could be found for framing an accusation against him; while the rash and thoughtless Drusus too often laid himself open to the machinations of the common enemy of their family.[2]

Tiberius retires to the island of Capreæ.

Having performed the dedication of the temples in Campania, which had furnished the immediate pretext for his removal from Rome, Tiberius, in the year 780, crossed the bay of Naples in quest of the spot which he had already destined for his final retreat.[3] In vain had

[1] Tac. *Ann.* iv. 59.; Suet. *Tib.* 39.
[2] Tac. *Ann.* iv. 60.
[3] Tac. *Ann.* iv. 67.

he issued orders, while traversing the dense populations of the continent, that no man should presume to disturb his sullen meditations, and had even lined his route with soldiers to keep his importunate admirers at a distance. The concourse of idle and gaping multitudes whom his arrival brought everywhere together became more and more odious to him, and the sullenness with which he spurned observation gave colour to the notion that he shunned exhibiting to strangers the deformity of a diseased and bloated countenance. He hastened to bury himself in the pleasant solitudes of the little island of Capreæ. While yet in the maturity of his powers Augustus had been attracted by the charms of this sequestered retreat; he had been struck particularly with the omen of a blighted ilex reviving here during a visit he paid to the spot. Its genial climate, he conceived, might conduce to the maintenance of his own health in more advanced age, and with this view he obtained the cession of it from the Neapolitans, to whose city it belonged, in exchange for the more important nor, as reputed, less salubrious island of Ænaria.[1] Capreæ at this time indeed was little better than a barren rock, the resort of wild goats, from which it derived its name, about eleven miles in circuit; but it lay within two hours' row of Misenum, the great naval station of the Lower Sea. Easily accessible from the mainland at one point, which it required little

Description of Capreæ.

[1] Ænaria or Inarime was famous for its medicinal springs: "Ænariæque lacus medicos." Stat. *Sylv.* iii. 5. 104. Augustus got possession of Capreæ in the year 725. Dion, lii. 43. Comp. Suet. *Oct.* 92. Virgil, on his return from Greece in 735, devoted the remaining months of his life to the revision of the Æneid at Naples, and some passages even in the earlier books bear marks of interpolation at this period. Possibly the reference to Capreæ (*Æn.* vii. 735.) is meant as a compliment to Augustus: "Teleboum Capreas cum regna teneret Jam senior." Augustus, then just completing his forty-fifth year, was on the verge of Roman seniority.

vigilance to secure, the island is singularly difficult of approach at every other. Its shores consist of limestone cliffs, sheer precipices in most parts plunging directly into the deep sea. They are furrowed here and there by those caverns celebrated for the play of coloured light in their recesses, which, after having amused and astonished the curious of our time as recent discoveries, are now ascertained to have been the forgotten haunts of Roman luxury. In the interior, an uneven but cultivable surface rises at either end of the island to the height of one thousand and two thousand feet respectively; the eastern or lower promontory having been, according to tradition, the favourite sojourn of Tiberius, and its dizzy cliff the scene of his savage executions. We have before noticed the channel, six miles wide, which separated it from the coast of Campania, whence it seems to have been divorced by a convulsion of nature, and the two famous sea-marks which faced each other on opposing summits, the pharos of Capreæ and the temple of Surrentum. But while few other spots could have combined the requisites of solitude and difficult approach with such actual proximity to the seat of government, Tiberius was not insensible to the charms of its climate, and even the attractions of its scenery; to the freshness of its evening breeze, the coolness of its summers, and the pleasing mildness of its winters.[1] The villas he erected on the fairest sites within these narrow limits, twelve in number and named after the greater gods of the Olympian consistory, enjoyed, we may suppose, every variety of prospect, commanded every breath of air, and caught the rays of the sun at every

[1] Statius (*Sylv.* iii. 5.) invites his wife to the shores of his native Parthenope:

"Quas et mollis hyems et frigida temperat æstas;
Quas imbelle fretum torpentibus alluit undis."

Could the lady resist so sweet an invitation to so sweet a place?

point of his diurnal progress.[1] From the heights of Capreæ the eye comprehended at one glance the whole range of the Italian coast from the promontory of Circe to the temples of Pæstum, clearly visible through that transparent atmosphere. The Falernian and Gauran ridges, teeming with the *noblest* vineyards of Italy, the long ranges of the Samnite Apennines, even to the distant Lucanian mountains, formed the framework of the picture, while Vesuvius reared its then level crest, yet unscarred by lava, directly in the centre. Facing the south, the spectator gazed on the expanse of the Sicilian Sea. So wide is the horizon that it is, perhaps, no fiction that at some favourable moments the outlines of the fiery isles of Æolus, and even of Sicily itself, are within the range of vision. The legends of Circe and Ulysses, of Cimmerian darkness and Phlegræan fires, of the wars of the Giants with Jupiter, and the graceful omens which attracted the first settlers to these shores from Greece, had perhaps a strange fascination for the worn-out soldier and politician.[2] Reclining on the slopes of Capreæ, and gazing on the

[1] Tac. *l. c.* In his charming description of the villa of Pollius on the Surrentine promontory, Statius specifies the various objects in view from the spot, which are nearly the same as those commanded by Capreæ. The spacious residence of his friend comprised all the advantages which could be sought for in the divers localities of the Tiberian pleasure-houses:

"Quæ rerum turba! locine
Ingenium an domini mirer prius? hæc domus ortus
Prospicit, et Phœbi tenerum jubar; illa cadentem
Detinet, exactamque negat dimittere lucem ....
Hæc pelagi clamore fremunt; hæc tecta sonoros
Ignorant fluctus, terræque silentia malunt ....
.... Quid mille revolvam
Culmina, visendique vices? sua cuique voluptas
Atque omni proprium thalamo mare, transque jacentem
Nerea diversis servit sua terra fenestris ...."

Stat. *Sylv.* ii. 2. 44.

[2] Stat. *Sylv.* iii. 5. 79.:

"Parthenope, cui mite solum trans æquora vectæ
Ipse Dionæa monstravit Apollo columba."

glorious landscape before him, Tiberius might dream of a fairyland of the poet's creation, and seek some moments of repose from the hard realities of his eternal task, to perplex his attendants with insoluble questions on the subjects of the Sirens' songs and the name of Hecuba's mother.[1] Nor could he be unmoved, though dallying with these fanciful shadows, by the deep interest which the records of actual history had thrown over the fateful scene. There lay the battle-fields of the still youthful republic: there the rugged Roman was first broken by the culture of Hellas: there captive Greece first captured her conqueror. There were the plains in which the strength of Hannibal had wasted in ignoble luxury; and the dark crater of Vesuvius, from whence had issued the torrent of servile insurrection, when the empire of the world was for a moment shaken by the rage of a Thracian bondman. The great Italian volcano had slumbered since the dawn of history. Tokens indeed were not wanting on the surface of the fires still seething beneath the plains of Campania; the sulphureous exhalations of Baiæ and Puteoli still attested the truth of legends of more violent igneous action on which the local mythology was built. But even these legends pointed to no irruption of Vesuvius; no cone of ashes rose then as now from its bosom; and cities and villages clustered at its foot or hung upon its flanks, unconscious of the elements of convulsion hushed in grim repose beside them.[2]

[1] Suet. *Tib.* 70. "Maxime tamen curavit notitiam historiæ fabularis, usque ad ineptias atque derisum. Nam et grammaticos, quod genus hominum, ut diximus, maxime appetebat, ejusmodi fere quæstionibus experiebatur: quæ mater Hecubæ: quod Achilli nomen inter virgines fuisset: quid Sirenes cantare sint solitæ."

[2] Tac. *l. c.*: "Prospectabatque pulcherrimum sinum, antequam Vesuvius mons ardescens faciem loci verteret." This was written about thirty years after the destruction of Herculaneum and Pompeii.

During his protracted sojourn in this pleasant locality the imperial hermit crossed but rarely to the continent, and twice only made as if he would revisit the city.[1] The seclusion of his lonely rock was guarded with the strictest vigilance, and the chastisement he was said to have inflicted on the unwary fishermen who landed on the forbidden coast increased the mysterious horror with which it came soon to be regarded.[2] But day by day a regular service of couriers brought despatches to him from the continent; nor did he ever relax from the scrupulous attention, in which he had so long been trained, to the details of business sent him by his ministers, which must have employed his mind and tasked his patience for many hours. He was surrounded moreover in the recesses of his privacy by a number of literary men, professors of Greek and other foreign extraction, among whom he diverted himself with abstruse inquiries, such as have been already noticed, into the most unprofitable questions of mythology or grammar. Distraction of mind was the object of his literary recreations; but like the generality of his busy and restless countrymen, he had no taste for matters of really interesting inquiry, and his studies, if not pernicious, were at best merely curious. He was peculiarly addicted to conversation with the soothsayers, of whom he entertained a troop about his person, making constant experiments of their skill in the examination of the lives and fortunes of his associates. Such was the account which reached the city of the life of the imperial misanthrope: it was coloured no doubt and distorted, inflamed and exaggerated: nevertheless it did not suffice to satisfy the prurient curiosity of

Occupation of Tiberius at Capreæ.

[1] Suet. *Tib.* 72.: "Bis omnino toto secessus tempore Romam redire conatus," scil. ann. 786. 788. Comp. Tac. *Ann.* vi. 1?; Dion, lviii. 21. 25.

[2] Suet. *Tib.* 60.

the citizens, stimulated beyond its wont by the extraordinary circumstance of his retirement from public observation. They filled the hours they supposed to be vacant from business with amusements of a far less innocent character, with debaucheries of the deepest dye, and cruelties the most refined and sanguinary: they accused the Roman Cæsar of the crimes of a Median or Assyrian; as if their perverted imaginations delighted in contrasting the most exquisite charms of nature with the grossest depravation of humanity: and all these charges, whether or not they were in his case really true, of which we have little means of judging, found easy credence from the notorious vices of their own degraded aristocracy.[1]

Further deterioration in the government of Tiberius.

The retirement of Tiberius to Capreæ has been justly regarded as an important turning-point in his career; inasmuch as, having thereby screened himself from the hated gaze of his subjects, he could from thenceforth give the rein, without shame or remorse, to the worst propensities of his nature. From this time undoubtedly we find him less anxious to moderate the excessive flatteries of the senate, or to mediate between its servile ferocity and the wretched victims of the delators. Even on the calends of January, the strictest holiday of the Roman year, he could turn his solemn missive of vows and congratulations to a demand for the blood of Titius Sabinus, of distinguished equestrian family, who had been betrayed by a base intrigue.[2] *What a commencement for the new year is this!* exclaimed the affrighted citizens. *What victims are these with which Sejanus requires to be appeased! What day from henceforth will pass*

[1] Suet. *Tib.* 43—45.

[2] Tac. *Ann.* iv. 68.: "Junio Silano et Silio Nerva coss. (A.U. 781), fœdum anni principium incessit."

without an execution, if a season so holy and festive must be profaned with the chain and cord! But the emperor had attained a position in which he could despise these murmurs. The complaints he urged upon the senate of the peril in which he fancied himself to stand, as the mark of so many secret conspiracies and machinations, were interpreted into dark insinuations against his own nearest kindred: every member of the imperial family, cut off by age or accident, was supposed to relieve him either from the fear of intrigues, or the mortification of being observed and thwarted. Presently the Romans imagined that the cares of empire were neglected: an outbreak of the Frisii, which seems in fact to have been speedily repressed, was exaggerated by their undue apprehensions; and it was believed that Tiberius disguised the real extent of the disaster to avoid the necessity of sending a special legate to retrieve it.[1] Nevertheless the senate, we are told, was not so much concerned for a frontier injury, as for the perils by which it seemed itself environed at home; and against these it could devise no other precaution than the most lavish adulation of the emperor. It decreed an altar to Clemency and another to Friendship, by the side of which images of Tiberius and Sejanus were to be erected, and at the same time importuned its prince with fresh entreaties for the happiness of once more beholding him. But neither Tiberius nor his favourite vouchsafed a visit to the city or its vicinity. They contented themselves with leaving the island, and exhibiting their august presence at the nearest point of the Campanian coast. Thither flocked the senators, the knights, and numbers of the inferior citizens, more apprehensive of their reception by Sejanus than

[1] Tac. *Ann.* iv. 72.

even by Tiberius himself: nor did the minister's conduct belie the dread they had conceived of him, since the retirement of his master had served to exalt him to a higher pinnacle than ever. Amidst the various avocations of life in the city, the trooping of flatterers and courtiers to his levees might be less open to remark; but in the country, where there was no other occupation and no other diversion, every one's eyes intently watched all the rest, and the Romans were shocked at the evidence they presented to one another of the extent of their own servility. At last Sejanus, in his arrogance, as they said, forbade them even to throng his doors or crowd around him on the sea-shore: he was afraid no doubt of the jealousy of his master; and they returned in dismay and dejection to their homes, to expiate hereafter as a crime the intimacy they had so blindly pressed upon him.[1]

Death of Julia the younger, the grand-daughter of Augustus

The year 781, the first of Tiberius's sojourn at Capreæ, beheld the death of the unfortunate Julia, the grand-daughter of Augustus, in the barren island of Trimerus, off the coast of Apulia; a woman whose amours had once threatened to raise up candidates for the throne, but who in her disgrace had been so completely abandoned by her friends and family that she owed, it was said, the protraction of her miserable existence for years to the ostentatious compassion of Livia.[2] She was speedily followed to the grave by this hateful protectress. The mother of the emperor, having held in her own hands for seventy years the largest share, it may be, of actual power of any personage in the state, paid at last the debt of nature, at the moment when her son had effected his escape from

[1] Tac. *Ann.* iv. 74.

[2] Tac. *Ann.* iv. 71.: "Augustæ ope sustentata, quæ florentis privignos cum per occultum subvertisset, misericordiam erga adflictos palam ostentabat."

her oversight, and had perhaps for the first time defied her influence. She died in the year 782, at the advanced age of eighty-six, a memorable example of successful artifice, having attained in succession, by craft if not by crime, every object she could desire in the career of female ambition.[1] But she had long survived every genuine attachment she may at any time have inspired, nor has a single voice been raised by posterity to supply the want of honest eulogists in her own day. Her obsequies gave occasion for the first public appearance of Caius, the youngest of the sons of Germanicus, at this time in his seventeenth year, to pronounce her funeral oration; for Tiberius excused himself from attending, while he persisted in making no change in the usual disposition of his day, and forbade the senate, pretending that such was her own desire, to decree divine honours to the deceased.[2] At the same time he took occasion to show his sense of the liberty he had recovered by his mother's death, by some pointed remarks on the servile flattery of the *woman's friends*, her associates. These remarks were directed, it was believed, more particularly against the consul Fufius, who had ventured, under the powerful protection of the empress, to indulge in unseemly sneers against the emperor himself.[3] While such was the demeanour of Tiberius, it was evident that he felt no personal regret for the loss he had sustained, and the funeral passed over with little ceremony or magnificence. Even the will of Livia remained for a long time unexecuted.[4]

Death of the empress Livia.

[1] Tac. *Ann.* v. 1.; Dion, lviii. 2. Pliny makes her eighty-two: but as Tiberius was now in his seventieth year, the earlier date assigned for her birth is undoubtedly the true one. Plin. *Hist. Nat.* xiv. 8.

[2] Tac. *Ann.* v. 1, 2.; Dion, lviii. 2.

[3] Tac. *l. c.*: "Dicax idem, et Tiberium acerbis facetiis irridere solitus."

[4] Suet. *Tib.* 51. In this and the preceding chapter instances are

Her character.

The obsequies of the consort of Octavius were celebrated under the name she had long borne in public of Julia Augusta. By admission into the Cæsarean family she had become invested with the undefinable charm of far descended glory common to the children of Venus and Iulus, which might seem to extend to her a rightful claim to apotheosis hereafter, together with her husband and his divine parent. But her union with Octavius had in the meantime entitled her to a share in the high and expressive designation of August, which was scarcely distinguished in the popular apprehension from that of mistress or sovereign. She glided gracefully from the wheel and the women's chamber to the chair of council and even to the throne of state: the first of Roman matrons she had been suffered, if not to assume a public capacity, at least to be addressed as a public character.[1] Though little scrupulous, we may believe, in the pursuit of her personal objects, she was not without a right royal sense of the true dignity of her unexampled position. To the sterner counsels of her husband she brought the feminine elements of softness and placability. The policy of Augustus in his later years was impressed with the mildness and serene confidence of his consort; and even under the gloomier tyranny of his successor her chamber was the asylum of many trembling victims of persecution, her extended arm bade defiance to the arts of an Afer and the power of a

given of the impatience with which Tiberius latterly bore the domination of his mother; his harsh language towards her and about her, and the indifference he manifested at her decease.

[1] Thus we find her addressed in the *Consolatio de morte Drusi* as Princeps. The senate upon her death decreed her an arch, and the title of Mater Patriæ, which Tiberius refused to ratify: nevertheless medals exist on which such a legend appears, and it is a question whether these were not struck in her honour even during the lifetime of Augustus. See Eckhel, vi. 154, 155. Livia ultimately obtained deification under the principate of her grandson Claudius.

Sejanus.[1] Nor was her private benevolence less conspicuously exerted in behalf of noble indigence. She caused many poor but well-born children to be educated at her own expense, and gave portions to many marriageable maidens.[2] Her fidelity to her husband may have been the result of prudence, her devotion to her son a calculation of ambition; but it is impossible not to read in the monuments of her innumerable household, the tirers of her person, the attendants at her repasts, the ministers of her charities, whom she survived to bury in one family mausoleum, tokens of kindness and generosity, however mingled with pride, which appeal forcibly to our admiration.[3] But a later generation could never forgive her for being the mother of Tiberius; and every step by which the tyrant, the patron of the informers, the decimater of the senate, advanced to the sovereignty of the Roman people was ascribed to the ambition, the arts, and the crimes of the unfortunate Livia. The proscriptions were forgotten in fifty years, the delations never.

[1] Dion, *l. c.*: καὶ ἀψῖδα αὐτῇ, ὃ μηδεμίᾳ ἄλλῃ γυναικὶ, ἐψηφίσαντο, ὅτι τε οὐκ ὀλίγους σφῶν ἐσεσώκει, καὶ ὅτι παῖδας πολλῶν ἐτετρόφει. Comp. Vell. ii. 130.: "Per omnia diis quam hominibus similior fœmina, cujus potentiam nemo sensit nisi aut levatione periculi aut accessione dignitatis."

[2] The Roman Juno was as merciful as she was modest, if we may believe a fantastic story of Dion's: γυμνούς ποτε ἄνδρας ἀπαντήσαντας αὐτῇ καὶ μέλλοντας διὰ τοῦτο θανατωθήσεσθαι ἔσωσεν, εἰποῦσα ὅτι οὐδὲν ἀνδριάντων ταῖς σωφρονούσαις οἱ τοιοῦτοι διαφέρουσι. Dion, *l. c.*

[3] The single columbarium of Livia which has been discovered, and probably there were more, contains the ashes of above a thousand of her slaves and freedmen: the diversity of their employments, all of which are carefully recorded, is, as may be supposed, almost infinite. See Wallon, *Esclavage*, ii. 145., foll. after Gori.

CHAPTER XLVI.

The fate of the family of Germanicus.—Banishment of Agrippina and her son Nero.—Disgrace and imprisonment of her son Drusus.—Persecution of her friends.—Fate of Asinius Gallus.—Culmination of the fortunes of Sejanus.—His alliance with the imperial family and consulship (A. U. 784).—Alarmed at the jealousy of Tiberius, he conspires against him.—Tiberius determines, with the assistance of Macro, to overthrow him.—His arrest in the senate-house, and execution.—Proscription of his adherents.—Vengeance for the murder of Drusus.—Savage cruelty of Tiberius.—Horrible death of the younger Drusus.—Agrippina starves herself.—Infatuation of Tiberius.—His mortification at the despondency of the nobles.—Voluntary deaths of Nerva and Arruntius.—Prospects of the succession.—Caius Caligula and the young Tiberius.—Ascendancy of Macro.—Last days and death of Tiberius (A. U. 790).—Effects of the reign of terror: alarm of the nobles; thoughtless dissipation of the populace.—The provinces generally well cared for and prosperous.—Example from the state of Judea. (A. D. 29—37, A. U. 782—790.)

Tiberius complains to the senate of Agrippina and Nero.

THE first incident which marked the withdrawal of Livia's protecting wing from the afflicted, was the appearance of a harsh despatch from Tiberius to the senate, directed against Agrippina and her son Nero. This letter, it was believed, had been written some time earlier, but withheld through the influence of the empress, who, while she was gratified by the depression of the family of Germanicus, had nevertheless exerted herself, not without success, to shield it from ruin. The emperor now complained in bitter terms of the alleged misconduct of his grand-nephew; not, indeed, of any political intrigues to his own prejudice, but of personal vices and dissoluteness; against the chaste matron, his mother, he had not ventured

to utter even such imputations as these, but had confined himself to reproving once more the vehemence so often remarked in her language and demeanour. The senators were in great perplexity: ready as they were to carry out the commands of their master, however atrocious, they dared not act on murmurs which conveyed no express order, and made no demand on their active interference. While they deliberated, however, warned by one of their own body to take no hasty step in so delicate a matter, the people assembled before the doors, and bearing aloft the effigies of their favourites, shouted aloud that the letter was an abominable forgery, and the lives of the emperor's nearest kindred were menaced without his knowledge, and in defiance of his inclinations. These cries evidently pointed at Sejanus as the contriver of a foul conspiracy; but the favourite, perceiving his danger, played dexterously on his master's fears, representing the movement as an act of rebellion, the images of Nero and Agrippina as the standards of a civil war, till he wrung from him a second proclamation, in which the impetuosity of the citizens was sternly rebuked, the tardiness of the senate reproved more mildly, and the charges against the culprits repeated, with a distinct injunction to proceed at once to consider them with due formality.[1]

Thus encouraged and stimulated to take their part, the senators declared that they had only been withheld from a more zealous defence of the imperial majesty by the want of definite instructions. Sejanus triumphed; accusers sprang up at his beck; the process was carried through, we may believe, with all the disregard of decency and justice for which the tribunal of the fathers had long been infamous; and though we

They are banished to islands.

[1] Tac. *Ann.* v. 5., A.U. 782. From this point there is a lacuna of two years in the annals of Tacitus.

have lost the details of it, we know that its result was fatal to its unfortunate victims, and that both the mother and son were banished to barren islands, the one to Pandateria, the other to Pontia. True to the indomitable ferocity of her character, the she-wolf Agrippina resisted the atrocious mandate with violence, and in her struggle with the centurion in whose charge she was placed, such was the horrid story which obtained credence with the citizens, one of her eyes was actually struck from her head.[1] Sejanus now urged his success with redoubled energy. He had removed his two most conspicuous rivals to an exile from which the members of the imperial family were never known to return. Drusus still remained, of an age and character to compete with him in the career of his ambition. Tiberius retained this prince, together with his younger brother Caius, about his own person at Capreæ: there was the more reason to fear the favour he might acquire with his aged relative; nor were there the same opportunities for misrepresenting his conduct, or urging him by insidious advisers into political intrigues. But Sejanus, in seducing the affections of his consort Lepida, found the means of undermining his credit with the emperor. The faithless spouse was engaged, by the promise perhaps of marriage with Sejanus, as the wife of another Drusus before her, to excite the jealousy of Tiberius against her husband; and thus even the recesses of the imperial retreat, in which the old man had sought to bury himself from the crimes and follies of the world he hated, were opened to the machinations of his most intimate friends and relatives. Drusus was dismissed from Capreæ, and ordered to repair in disgrace to Rome. But Sejanus was not satisfied with this indication of the sovereign's anger: fearing lest

Sejanus obtains the disgrace of the younger Drusus.

[1] Suet. *Tib.* 53.

his master might change his mind, he induced the consul Cassius Longinus to make a motion in the senate on the prince's presumed misconduct; and the fathers hastened to respond to it by declaring him a public enemy. Drusus was immediately placed under arrest; but the privileges of noble rank still exempted him from confinement in the Mamertine dungeons, and he was thrust, in mockery of the free custody which was his legal right, into a subterranean chamber of the palace.[1]

Tiberius persecutes the friends of Livia.

Livia, as we have seen, had been surrounded in her later years by a little court of her own favourites, and among them were many grumblers and captious enemies of the emperor, who obtained leave, by flattering the vanity of their mistress, to vent even in her ears their ill-feeling towards the chief of the state. In vain had Tiberius chafed under the jeers of this licensed coterie; the influence of his mother had protected it, and he had been compelled to brood in secret over mortifications which he had not the spirit to resent. But he had not forgotten a murmur or a smile; and as soon as the patroness of the group was removed, he made his long-checked vengeance felt by its members in succession. The friends of Agrippina and her children he regarded in a still more serious light. They constituted in his view, not a private clique of dissatisfied scoffers, but a political faction; they were not discontented with his conduct or government, but, as he thought, and others doubtless thought the same, prepared as foes and rivals to substitute another government, the government at least of another, in its room. In the councils of this faction lay, as he conceived, the germs of a revolution of the palace and even of civil war. Among its chiefs were men of the

[1] Suet. *Tib.* 54.; Dion, lviii. 3., A.U 783. At this point there is a short break in the remains of Dion's history.

highest birth and character. None was more distinguished than Asinius Gallus, now an old man, and a veteran dissembler, whose pretensions have already been noticed. This man had presumed to take to wife the unfortunate Vipsania, the same from whom Tiberius had been compelled to separate himself; and besides the personal feelings which this marriage had caused him, Tiberius beheld in it a covert aspiration to a share in the imperial inheritance. At the commencement of his principate he had been openly treated by Asinius as an equal in an assembly of equals. In consequence he had never ceased to regard him with jealousy; and when latterly he observed him paying marked court to Sejanus, he resented it perhaps as an attempt to disguise increasing hostility to himself.[1] When Asinius came at last to Capreæ, as the bearer of a vote of fresh honours to the favourite, Tiberius received him indeed with the utmost apparent cordiality, but at the same time clandestinely despatched an accusation against him to the senate, and the senate proceeded to pass sentence upon him without a hearing, at the very moment that he was being entertained at the emperor's table. The consuls sent a prætor to Capreæ to arrest him before the eyes of his host, who affected surprise and sympathy, and desired that he might be kept in honourable custody till he should come in person to take cognisance of so lamentable a case.[2] This period, however, never arrived; and it was not till after three years of close and cruel imprisonment that Tiberius consented at last to give the word, not for his release, but for his

Cruel fate of Asinius Gallus, a friend of Agrippina.

[1] Of Asinius, Augustus, as we have seen, had said that he was ambitious but incapable. The conceit and captiousness of his feeble character appears in the presumption with which, like his father Pollio, he criticized the language and genius of Cicero. Quintil. xii. 1. 22.; Gell. *Noct. Att.* xvii. 1.; Suet. *Claud.* 41.; Plin. *Epist.* vii. 4.

[2] Dion, lviii. 3.

execution, accompanied, it was said, with the savage remark, *Now at last I have taken him back to favour.*[1]

The base dissimulation of Tiberius, which he now seemed, from long habit, to practise almost unconsciously, and where for his own purposes it was least required, may serve to aggravate our disgust at his callous insensibility. We need not suppose, however, that it was from any wanton cruelty that so long a punishment was inflicted on the sufferer

Procrastination and irresolution of Tiberius.

Among the infirmities which grew on Tiberius with advancing age were irresolution and procrastination, and neither in giving audience to an embassy, nor in deciding the fate of a criminal, could he determine to act with the promptness which befitted his position.[2] His jealousy once aroused with regard to Sejanus, he could not nerve himself to any definite course of action. The clamours even of the insensate populace had not been lost upon him; though every demand for the punishment of his relatives had come to him direct from the senators, he could not but perceive that the favourite might have moved them to it. From the objects of suspicion thus indicated to him, every suspicion rebounded on the head of the favourite himself. While he sought to disguise his doubts and anxieties, yielding in every point, more readily than ever, to the counsels of his insidious adviser, and consenting at his instance to the disgrace of his kinsmen or courtiers, he shrank day by day from issuing the order which should deprive him irrecoverably of their services. Thus while he kept Asinius and Drusus in confinement to gratify Sejanus, he could not yet resolve to

[1] Dion, lviii. 23.: who repeats, however, the same expression on another occasion. Comp. also Suet. *Tib.* 61.: "Et in recognoscendis custodiis precanti cuidam pœnæ maturitatem respondit: nondum tecum in gratiam redii."

[2] Joseph. *Antiq. Jud.* xviii. 7. 5.

deliver them to the executioner. Meanwhile he continued to heap fresh honours on his minister with a restless profusion, which itself implied distrust. Though the hopes Sejanus had conceived of entrance into the Julian house through an union with Livilla had been discouraged and deferred, it appears that the emperor relaxed after a time in his opposition to them, and that they were crowned, as has been said, at least with the ceremony of a betrothal. The marriage indeed may never have taken effect, though so completely was the connexion of Sejanus with his master secured by the mere act of affiance, that he receives from Tacitus the title of his son-in-law.[1] But the loss of the greater part of the fifth book of Tacitus's Annals deprives us of our surest guide to the machinations of the emperor and his minister. It would seem probable, however, that Tiberius, soon after the confinement of Drusus, became alarmed at the formidable attitude his favourite had assumed; and we may believe that, in conferring upon him the last marks of confidence he was really meditating his overthrow. Nevertheless when, on the first day of 784, Sejanus entered with Tiberius on the consulship, the worshippers of his uprisen star were disturbed by no presentiment of its impending decline. The origin of Sejanus was not such as to entitle him to an honour from which Mæcenas had modestly shrunk; but his flatterers, ascending higher in the annals of the republic, compared his rise with that of a Coruncanius, a Carvilius, a Marius, or a Pollio. It was no novel principle, they declared, for the senate or people to choose the

Sejanus becomes affianced to Livilla.

He is advanced to the consulship, A. U. 784.

[1] Tac. *Ann.* v. 6., vi. 8. See above. Zonaras (xi. 2.) says expressly that he was married to Julia, daughter of Drusus; but Julia, the only daughter of Drusus we know of, was married to Nero. Tac. *Ann.* iii. 29., iv. 60., vi. 27. See Ritter on *Ann.* vi. 8., Suet. *Tib.* 65.; "Spe affinitatis deceptum."

best men for distinction regardless of their birth; and it was now left for Tiberius to show that the wisdom of the emperor was not inferior to that of the citizens.[1] While, however, all orders vied with one another in the respect they paid to Sejanus, while the petitioners who had flocked to the minister in Campania had been more numerous than those who courted the prince himself, while games and holidays were voted in his honour, and before his images or pictures altars were raised, vows conceived, and sacrifices offered, an excess of flattery which the emperor had personally spurned, Tiberius trembled more and more for his own safety, and was anxious at least to remove their idol from his presence. Accordingly, when he associated Sejanus with himself in the consulship, he deputed him to perform alone the actual functions of both in the city; and now Sejanus, it was remarked, was emperor of Rome, while Tiberius was merely lord of an island.[2] The senators received the leader of their debates with acclamations, and Sejanus, though not unconscious of the workings of jealousy in his master's mind, persuaded himself that he had reached an eminence from which he could control or even defy them. The attachment of the citizens towards him was now, he conceived, amply demonstrated: the alacrity with which they hailed him as the emperor's colleague betokened their full consent to his seizing the undivided empire. The decree of the senate, which now conferred on him jointly with Tiberius the consulate for five years, sounded in his ears like the entire surrender of the government to his hands, as it had formerly been surrendered to Augustus; and if any material resources were yet required to secure his usurpation, he could wield, as

Tiberius and Sejanus consuls.

[1] Vell. ii. 128.

[2] Dion, lviii. 5.: ὥστε συνελόντι εἰπεῖν, αὐτὸν μὲν αὐτοκράτορα, τὸν δὲ Τιβέριον νησίαρχόν τινα εἶναι δοκεῖν.

he conceived, in his faithful prætorians the final arbitrament of the sword.

Tiberius and Sejanus resign the consulship.

Since his accession, however, to the principate, it had been the custom of Tiberius to retain his consulships only for a short period. In 771 he had abdicated office after a few days; in 774 after three months.[1] Now also, far from accepting the proffered five years, he resigned the consulship in the fifth month; and Sejanus, it seems, was required at the same time to give way to a consul suffect.[2] Faustus Cornelius Sulla was supplied in the place of the one, Sextidius Catullinus received the fasces from the other. Sejanus possibly now felt for the first time that he was treading a downward path. The flattering decree by which his consulship was held up to the imitation of all future magistrates, the offer of the proconsular power which was at the same time made to him, and his elevation by the emperor to the dignity of the priesthood, would all fail to reassure him; for at the same time Caius Cæsar was advanced to the priesthood also, and the favour with which the young prince was mentioned in an imperial rescript had been accepted by the citizens as a token that he was actually destined for the succession. Uneasy and irresolute in the midst of his success, Sejanus bethought himself of the resource which had hitherto never failed him, of a personal interview with his patron. He asked permission to visit his affianced bride, who was retained beneath the roof of her father-in-law at Capreæ, under the pretext of a sickness from which she was suffering. But to this demand Tiberius returned a refusal, though softened by the excuse that he was himself prepar-

Tiberius refuses to see Sejanus,

[1] The consulship of 784 was Tiberius's fifth. See Tac. *Ann.* iii. 31. Suetonius, in calling it his third, is speaking only of his principate.

[2] Hoeck, *Rœm. Gesch.* i. 3. p. 153., from Noris. *Epist. Cons.* in Græv. *Thes.* xi. 404.

ing speedily to remove with his family to Rome[1] This repulse was followed by a decree forbidding divine honours to be paid to any mere mortal, and fatal significance was attached to a letter, throughout which the bare name of Sejanus was mentioned, without the addition of any of his titles. At the same time some of his personal enemies, it was observed, received unusual favours; all which things were not overlooked by an anxious and vigilant herd of courtiers, as ominous of impending disgrace. Already the crowd of senators and freedmen began to waver in their devotion to the upstart. But, on the other hand, his spirits were sometimes raised by the hints the emperor took care to drop of his own failing health; by the death of Nero in his confinement, starved, as was reported, by his unnatural uncle's commands[2]; and by the appointment of his creature Fulcinius Trio to the consulship for the latter part of the year. He was most concerned, however, by the manifest failure of the hopes he had entertained of the good will of the people, whose predilection for Caius, the youngest of the beloved family of Germanicus, had recently been warmly expressed. Regretting that he had wanted courage to strike openly while armed with the authority of the fasces, he began now to concert with his nearest intimates the means of assassination. The arrival of Tiberius at Rome would furnish ample opportunity to a friend, a kinsman, and a minister. Several of the senators had engaged in the enterprise, the guards had been tampered with and, it was hoped, secured; but the plot was soon

who concerts measures against his life.

[1] This seems to be the meaning of Dion, lviii.7.: *ὁ δ' οὖν Τιβέριος ταῖς μὲν ἱερωσύναις ἐτίμησεν αὐτὸν, οὐ μὴν καὶ μετεπέμψατο, ἀλλὰ καὶ αἰτησαμένῳ οἱ ὅπως ἐς τὴν Καμπανίαν, ἐπὶ προφάσει τῆς μελλονύμφου νοσησάσης ἔλθῃ, κατὰ χώραν μεῖναι προσέταξεν.*

[2] The death of Nero, which falls within the period for which we have lost the narration of Tacitus, is learnt from Suetonius, *Tib.* 5.

extended beyond the limits of safety. One of the conspirators, named Satrius Secundus, already infamous as a delator, revealed it to Antonia, the aged mother of Germanicus, a woman of noble character, who preferred, of the two persecutors of her race, to save Tiberius and destroy Sejanus.[1]

The conspiracy is divulged.

The emperor, possessed of all the proofs he required, hesitated, as usual, to act. He shrank from openly denouncing the traitor, and demanding his head of the senate; and against a covert surprise Sejanus had sufficiently guarded himself. The stroke of Tiberius was prepared with infinite cunning, and executed with consummate dexterity and boldness. He entrusted it to Sertorius Macro, an officer of the bodyguard, on whom, in the absence of Sejanus, he had, perhaps, relied for his personal security at Capreæ. To this man he gave a commission to take the command of the prætorians at Rome, and even empowered him, in the last necessity, to lead forth Drusus from his dungeon, and place him at the head of affairs.[2] It might not be safe, however, to assume authority over a jealous soldiery, devoted, apparently, to their familiar chief, and estranged from an emperor whose person they had almost forgotten. But Macro, resolute and crafty, was not daunted. He aspired to fill himself the place of Sejanus, and so lofty an ambition was to be deterred by no ordinary peril. Reaching Rome at midnight, the 17th of October, he sought an interview with Memmius Regulus, now the colleague of Trio in the consulship, and known for his

Measures of Tiberius to circumvent Sejanus.

[1] Joseph. *Antiq.* xviii. 7. 6. This conspiracy is unknown to Dion apparently, but alluded to by Tacitus, Suetonius, and Josephus. The loss of this portion of the Annals has deprived us of distinct proof of it, but it was mentioned no doubt in the Memoirs of Agrippina.

[2] Tac. *Ann.* vi. 23.; Suet. *Tib.* 65.

steadfast loyalty. Opening to him the purport of his mission, he required him to convene the senate early in the temple of Apollo, which adjoined the imperial residence on the Palatine. The spot was somewhat removed from the common thoroughfares of the city, and the approach to it by three narrow gates might be easily guarded against a sudden attack. Another recommendation might be its proximity to the place where Drusus was confined, should it become necessary to produce him. Macro next repaired to Græcinus Laco, the captain of the Urban police, and with him concerted measures for occupying the avenues to the temple with his armed force, while he should himself amuse the dreaded prætorians, and keep them close in their distant quarters. Thus prepared, he threw himself in the way of Sejanus, as the minister, wondering at the hasty summons, and foreboding no good to himself from it, was proceeding to the meeting escorted by an armed retinue. To him Macro blandly intimated that the occasion for which the fathers were convened was in fact no other than the gracious appointment, now about to be announced, of Sejanus himself to the tribunitian power, an appointment equivalent, as generally understood, to formal association in the empire. Intoxicated with the prospect of the consummation, at the moment when he had rashly resolved to hazard every thing on a daring treason, Sejanus was thrown completely off his guard. Shaking off at the temple door the attendance of his clients and soldiers, he entered with a light step and smiling countenance; while Macro, hastily communicating to the prætorians without that he was appointed their prefect, and promising them an ample largess on his installation, induced them to return with him to their camp, and attend while he announced the circumstance to their comrades. He only waited to present the emperor's letter to the

consuls, and then withdrew quietly in the tumult of applause which greeted it, leaving Laco to watch the proceedings. He required a little time to compose the temper of the guards, of whose ready acceptance of his appointment he could not feel secure. With this object the letter of Tiberius had been made more than usually diffuse. The consuls handed it in due form to the quæstor, and as soon as the buzz of expectation, and the compliments already passing between Sejanus and his flatterers, who comprehended the great body of the senate, were hushed, it was deliberately recited.

His dispatch to the senate.

Sejanus composed himself to endure the long preamble of the imperial missive, such as had before often taxed his patience, but never so much as on this fatal occasion.[1] It commenced with a passing reference to various affairs of state; then diverged to a gentle reproof of Sejanus himself for some trifling neglect; thence wandered again to more general subjects, mixed with strange, and as it seemed fantastic, complaints of the solitude of the poor old man, and his precarious position. It required one of the consuls to come with a military force to Capreæ, and escort the princeps into the city, that in the midst of his faithful citizens he might securely unbosom his griefs. From these desultory complaints, however, the letter descended gradually to particulars, and proceeded to demand the punishment of certain personages well known as adherents of Sejanus. For some time the senators had been growing uneasy, not knowing what upshot to anticipate to a missive, the tone of which waxed less and less in harmony with the addresses to which they had been accustomed. One by one they slunk away from the minister's side, and left him wondering and irresolute, still clinging to the hope that all would end

[1] Juvenal, x. 71.: "Verbosa et grandis epistola venit A Capreis."

as he wished, and shrinking to the last from the appeal to force which must irrevocably compromise him. The agitation of the assembly became more marked. Sejanus looked anxiously around. Suddenly, before the whole letter was yet unrolled, he found himself closely thronged by the chiefs of the senate, and precluded from shifting his position, while the sentence with which the long missive terminated denounced him by name as a traitor, and required the consuls to place him under arrest. Regulus called on him to surrender. Unaccustomed to hear the voice of authority, or bewildered with the sense of danger, he paused, and on a second summons demanded in confusion whether he was actually called? Once more the summons was repeated, and as he rose, Laco confronted him sword in hand, the senators sprang in a body to their feet, and heaped insults and reproaches upon him; while Regulus, fearing the risks of delay, staid not to put the question to the vote, but on the first voice given for his arrest, bade the lictors seize his hands, and hurried him off under an escort of guards and magistrates. Rapidly as he was transported from the Palatine to the Mamertine dungeon, for no measures of law or etiquette were kept at a crisis of such peril, the populace was already apprised of his disgrace, and as he was led across the forum he might behold with his own eyes the consummation of his fall, in the overthrow of his statues with ropes and hatchets. The effigies of public men, conspicuous in the Sacred Way, or enshrined in halls and theatres, served often to divert from more important objects the fury of an enraged populace. To crush the marble image of an enemy to powder, to break the gold or brass for the melting-pot, and condemn to ignoble uses the hated limbs and lineaments, was the first impulse of scorn and passion, and might sometimes save his palace from destruction and his family from

Sejanus is arrested.

outrage.[1] Macro in the meantime had not been less successful in the camp. By boldly advancing his offers to an immense amount, he had appeased the first outbreak of sedition among the soldiers, and when the senators ascertained that they were secure on that side, they met again the same day in the temple of Concord, as the spot nearest to the prison. Here, encouraged by the acclamations of the people and the indifference of the prætorians, they proceeded to anticipate the well-perceived wish of the sovereign, by decreeing death to the traitor. Sejanus was immediately strangled in the depths of his prison, and his body dragged to the foot of the Gemonian stairs for exposure. His death was followed without delay by the arrest of his family, his kinsmen and friends, the accomplices of his cherished schemes, or the instruments of his fraud and cruelty; while every one who hated the favourite or professed to love the emperor hurried to the spot where his remains were lying, and trampled with contumely on the ruins of power.[2]

and put to death.

The first days which followed this catastrophe at Rome were filled with scenes of confusion and slaughter. The populace rushing from one extreme to the other, now denounced the fallen minister as the perverter of the emperor's well-known generosity, and wreaked on his friends and creatures their vengeance for every wrong inflicted by Tiberius on the children and adherents of Germanicus. The prætorians were offended at the superior reliance the emperor had placed on the police, and vented their unreasonable indignation in acts of riot and plunder. The senators, one and

Confusion at Rome among all orders of the citizens.

[1] See the well-known lines of Juvenal, x. 61. foll.:

"Ex facie toto orbe secunda
Fiunt urceoli, pelves, sartago, patellæ."

[2] Dion, lviii. 9—11.; Seneca, *de Tranqu. Anim.* ii. 9.: "Quo die illum senatus deluxerat populus in frusta divisit." Juvenal, *l. c.*

all, apprehensive of the jealousy both of the emperor and the populace, rushed headlong to condemn every act of flattery they had so lately committed. They decreed that none should wear mourning for the traitor, that a statue of Liberty should be erected in the forum, that a day of rejoicing should be held, and finally that the anniversary of the happy event should be sanctified by extraordinary shows and solemnities. Excessive honours, they proclaimed, should never again be paid to a subject: and no vow should be conceived in the name of any mortal man, save of the emperor only.[1] Yet, so inconsistent is servility, they heaped in the same breath distinctions almost equal to those of Sejanus upon both Macro and Laco, which only the good sense of those fortunate officers induced them to decline. They urged Tiberius to accept the title of Father of his Country, an assumption he had ever modestly declined, and now again rejected with becoming resolution, as well as the proposal that the senate should swear to all his acts. His rugged nature was softened by the sense of his deliverance. The iron tears glistened on his cheek. *Steadfast as I feel myself*, he said, *in good and patriotic principles, yet all things human are liable to change; and never, so may the gods help me, will I bind the fathers to respect all the future acts of one who, even by falling from his right senses, may at any time fall from virtue.*"[2]

Tiberius, however, on his solitary rock had suffered hours of intense and restless anxiety. The desperate resolution to which he had braced himself for the destruction of Sejanus had given a shock to his whole system, and during the

Intense anxiety of Tiberius.

[1] The few existing coins of Sejanus have been purposely defaced, Eckhel, *Doctr. Numm.* vi. 196. We have busts ascribed to Brutus, Cicero, and Antonius, but none, I believe, of the disgraced minion of Tiberius.

[2] Suet. *Tib.* 67.

interval of suspense he seemed altogether unnerved. He had disposed a system of telegraphic communications to reach from Rome to Capreæ; and while, planted on the highest pinnacle of his island, he watched for the concerted signal of success or failure, a squadron of the swiftest triremes lay ready below to waft him, if required, without delay to the legions of Gaul or Syria.[1] When at last the news of the arrest and execution reached him, though relieved from an intolerable anxiety, he was yet so far from recovering his equanimity that he refused admittance to the deputation of senators, knights, and citizens sent in haste to congratulate him; nor would he even grant an interview to Regulus, his well-tried adherent, when he came, as the letter had directed him, to escort the emperor to Rome with a military equipage.

Proscription of the friends of Sejanus.

That the fall of a discarded favourite should be followed by the disgrace of his family, and perhaps of his intimate associates, would not be extraordinary under any monarchical regime; but the wide and sanguinary proscription which now descended on the nobility of Rome may confirm our surmise of the actual guilt of Sejanus, and of the discovery of a real plot against the ruler. Had indeed the long gathering discontent of the citizens come at last to a head? were the murmurs which, whether waking or sleeping, ever pressed on the ears of Tiberius, actually about to explode in revolt or assassination? was the long day-dream of his life, that he *held a wolf by the ears*, on the point of being realized in a fatal catastrophe? Such at least was the conviction under which his courage and even his reason staggered. Tormented as he was by these miserable alarms, we can be little surprised at

[1] Dion, lviii. 13.; Suet. *Tib.* 65.: "Speculabundus ex altissima rupe."

the bloodshed in which he sought to drown his apprehensions. Yet in the midst of his frenzy, he was not unmindful of his accustomed policy. The culprits whom he demanded for punishment were, at least at first, a few only of the most conspicuous; and these, with perhaps one or two exceptions, he was content to reserve for a future sentence. The choice as well as the condemnation of the majority of these victims fell to the senate itself, which partly from hatred of the fallen minister, partly to ingratiate itself with its terrified master, lent a ready ear to the delators, or impelled the course of justice with encouragements and rewards. Among the first to follow the fortunes of Sejanus was his uncle Blæsus, the object but recently of such special honours. Yet the sons of Blæsus were spared; and even a brother of the great criminal was suffered to escape, though, if we may believe a strange anecdote which has been reported to us, he had ventured to hold up the emperor to unseemly ridicule.[1] One of his nearest associates, named Terentius, was suffered to plead that, in giving his confidence to the favourite in the height of his influence, he had done no more than follow the example of Tiberius himself. A horrid story indeed is related of the execution of the young children of Sejanus, who were hurried off to death, with circumstances perhaps of more than ordinary atrocity, in the first frenzy of the proscription.[2] It

[1] The voluntary deaths of two Blæsi, evidently near relations and probably sons of Blæsus the uncle, are mentioned on a latter occasion. Tac. *Ann.* vi. 40. Lucius Sejanus, as prætor, had taken the fancy of ridiculing Tiberius, who was bald, by collecting a set of bald performers for the Floralia. The 5000 link boys, who were appointed to light the populace on their return from the theatre, were all closely shaven. Tiberius pretended not to notice the insult. Bald men, adds the historian, were from that time called Sejani, one does not well see why. Dion, lviii. 19.

[2] The story can only be told in the words of Tacitus himself: "Portantur in carcerem filius imminentium intelligens, puella adeo nescia, ut crebro interrogaret, quod ob delictum, et quo traherentur? neque

has been imagined that the historian Velleius Paterculus, whose brief but spirited sketch of Roman affairs terminates with the sixteenth year of Tiberius, and who is notorious for his flattery of Sejanus, was involved in the general wreck of the fallen minister's adherents: but there seems no reason to suppose this, the work itself having evidently reached its destined termination.[1] On the whole, it would appear that Tiberius, hardly less afraid to follow up his blow than in the first instance to strike it, was satisfied with watching from his retreat, which for several months he did not venture to quit, the proceedings of the senate against all who could be deemed his enemies. Nor was it only fear for himself that alternately exasperated and unnerved him. A terrible disaster recurred to his memory. The death of his son had been unexpected and premature. Sejanus had solicited the widow in marriage. Suspicion worked fiercely in the tyrant's brain. Had Drusus perished by poison, and was Sejanus the murderer? The surmise was speedily verified. Apicata, the divorced wife of Sejanus, had been spared in the search after the accomplices of his recent crimes. Her hatred to the husband who had so deeply injured her was a sufficient guarantee perhaps for her innocence of all concert with him now. But when she saw her children involved in the fate of their father she was distracted with conflicting feelings. As the last re-

facturam ultra; et posse se puerili verbere moneri. Tradunt temporis ejus auctores, quia triumvirali supplicio adfici virginem inauditum habebatur, a carnifice laqueum juxta compressam: exin oblisis faucibus, id ætatis corpora in Gemonias abjecta." *Ann.* v. 9. By the salvo, 'tradunt," &c. I conceive the writer to intimate that the story was not detailed in all its horrors by accredited histories, but was one of the flying anecdotes of the day (comp. *Ann.* i. 1.: "Recentibus odiis compositæ"), which he found too piquant to omit from his tableau. Compare the reference to it in Suetonius, who carelessly generalizes the particular story into an ordinary occurrence. *Tib.* 61. Dion (lviii. 11.) merely copies from the above.

[1] Vell. ii. 131.: "Voto finiendum volumen sit."

venge she could take on the cause of all her misery, she revealed every circumstance connected with the death of Drusus, with which she appears to have made herself well acquainted, the amours of Sejanus and Livilla, their guilty hopes and machinations, and the means by which they effected the destruction of their victim. Having made this disclosure, and excited the horror and dismay of the emperor to a pitch of frenzy, she put an end to her own life. Eight years had elapsed since the crime had been committed; but means for investigating the circumstances were still at hand, nor were objects wanting on whom the thirst for vengeance might be wreaked. The slaves and other agents employed were sought out and questioned in the presence of Tiberius at Capreæ, and the guilt of Livilla established beyond a doubt.[1] The public execution of a daughter of the imperial house was still an act from which the emperor would shrink; but he had other means not less sure for punishing her, and the report that, spared the cord or the falchion, she was starved to death in the custody of Antonia seems not unworthy of belief.[2]

Vengeance on the murderers of Drusus.

Early in the year 785 Tiberius crossed the narrow strait which separates Capreæ from Surrentum, and made a progress along the Campanian coast, as if about to revisit his capital. The citizens, still willing to deceive themselves as to his character and motives, were exulting in the assurance that with the fall of Sejanus a marked and happy change would appear in his behaviour. To the blighting influence of an unworthy favourite they fondly ascribed the reserve, the mo-

Tiberius quits Capreæ and approaches Rome.

[1] The stories of the tortures which used to be enacted in the presence of Tiberius at Capreæ for his amusement, of the bodies thrown over the cliffs, &c. (Suet. *Tib.* 62.), originated probably in the report of the proceedings of this domestic tribunal.

[2] Comp. Suet. *Tib.* 62. with Dion, lviii. 11.

roseness, and hardness of their master's temper, forgetting how the germs of these vices had been already manifested in his early youth, and that they were such as advancing years could not fail to confirm and aggravate. But as they had lately clapped their hands with savage delight over every fresh victim offered to the emperor's safety, so they were now prepared to welcome the emperor himself, as one restored from an unjust exile, and to exchange with him smiles of mutual love and reviving confidence. From Rhodes he had returned to the cold embrace of a haughty father; from Capreæ he would be welcomed by the acclamations of a humble and self-reproachful people. But the ardent greeting they reserved for him was destined never to be tendered. They were surprised, perhaps, to hear that his excessive timidity had induced him to quit the land, and take refuge on board a trireme, which bore him up the Tiber, while guards attended on his progress, and rudely cleared away the spectators from either bank. Such was the strange fashion in which he ascended the river as far as the Cæsarean Gardens and the Naumachia of Augustus; but on reaching this spot, and coming once more beneath the hills of Rome, he suddenly turned his prow without landing, and glided rapidly down the stream, nor did he pause again till he had regained his island.[1] This extraordinary proceeding, the effect of fear or disgust, caused no doubt deep mortification among the populace. It was followed by indignant murmurs, and petulantly ascribed to the foulest motives. Such, it was muttered, was the caprice, not of a princeps or an imperator, the child of law and organized government, but of a king: such a king as ruled with despotic sway over the slaves of Asia; such a king as, guarded in the citadel of Ctesiphon or Artaxata, de-

[1] Tac. *Ann.* vi. 1.

spised all human feelings, and trampled on all principles, sporting, for his selfish pleasure, with not the lives only, but the honour of his miserable subjects; such as tore from them their children to mutilate or deflower, and stimulated his brutal passions by the nobility of his victims. All this and worse was now freely ascribed to the recluse of Capreæ; he slunk, it was asserted, from the sight of the good and pure, to the obscurity of his detestable orgies; he was the patron of panders, the sport of minions; he was drunk with wine, and drunk with blood; the details which were freely circulated of his cruelty and licentiousness were coloured from the most loathsome scenes of the stews and the slave-market.

Atrocious licentiousness ascribed to him.

Such, unfortunately, was the open and flagrant character of Roman vice, that even the best and purest of the citizens were too much familiarized with its worst features to shrink from describing it with hideous minuteness. We may be permitted to cast a veil over a picture which called up no blush on the face of that generation, the fidelity of which, as regards Tiberius himself, we have no right either to affirm or deny. The excessive sensuality of the Roman nobles, pampered by all the appliances of art and luxury, was in fact the frenzy of a class deprived of the healthy stimulus of public action, and raised above the restraints of decency and self-respect. The worst iniquities ascribed to Tiberius may be paralleled in the conduct of private individuals, the accounts of which may have been coloured by a prurient imagination, but at least have not been distorted by malice.[1] The senators,

This licentiousness the common vice of his class.

[1] If I accept the charges of Tacitus and Suetonius against Tiberius, it is from my persuasion of the general character of vice in high places, as pourtrayed by Juvenal, Pliny, Seneca, Petronius, and in fact almost every writer of these times. Gems, mosaics, and other objects have been found in modern times at Capri, representing, it is

however, evinced no shame at the degradation into which their chief had fallen. They hastened to vote that the estates of Sejanus should be confiscated, not to the treasury of the state, but to the private purse of the emperor; and then, apprehending perhaps that his late hasty retreat had been caused by distrust of his subjects, ordained that whenever he vouchsafed to visit the Curia a special guard of their own body should attend upon him, A similar honour had been tendered to Julius Cæsar, and even Augustus, on a certain occasion, had availed himself of such a protection; it is not easy, therefore, to understand why it should have been left in this case to one of the least considerable of the order to propose, or be discussed and sanctioned with a smile of ridicule.[1] Tiberius, however, declined the equivocal compliment, which, indeed, would have little served to calm his fears had he really entertained the intention of again entering the senate-house; for it was among his proposed guards themselves, of whom few were not related to or associated with some of his victims, that his most dangerous enemies were numbered. At this moment his breast was torn by conflicting alarms. When his first fury against Sejanus was satiated, or his first blind apprehensions removed, he showed an inclination to desist from the proscription, and allowed himself in more than one instance to be swayed to mercy; not from compassion or clemency perhaps, but through fear of irritating too many families, and

said, the very monstrosities indicated by the historians, and have been considered as conclusive proofs of the facts charged against him. It is quite possible, however, that these objects were suggested by the descriptions themselves. At all events it must be remembered that the island was occupied by many successive proprietors after Tiberius, and among them by the virtuous M. Aurelius, all of whom must have had these indecent figures constantly in their sight. The age and the class must bear their share of the common guilt: "factum defendite vestrum, consensistis enim."

[1] Tac. *Ann.* vi. 2.; Dion, lviii. 17.

aggravating the perils against which he was guarding. But, on the other hand, the spirit of delation which he had evoked was now too potent to be laid. It had become the ambition, the glory, the livelihood of many; and to deprive them of it was to sow the seeds of perilous dissatisfaction among the cleverest, the boldest, and the most desperate class of citizens. While trimming the vessel of his fortunes between this Scylla and Charybdis, another rock soon appeared ahead. News was brought to Rome that a pretender to the name of the unfortunate Drusus, still a prisoner in the palace, had appeared in Achaia and Asia, and had deceived many by the similarity of his person, and the devotion to him of some of the freedmen of the emperor himself. As the reputed son of Germanicus he was received in various quarters with open arms. The Greeks were easily moved by anything strange and novel; the legions of Egypt and Syria, to which he was making his way, had loved and admired the man he claimed for his father. But the vigour of the imperial commanders speedily checked his enterprise. He was pursued across the Ægean and the Isthmus of Corinth to Nicopolis in Epirus, where, it appeared, having been more strictly interrogated, he had retracted his first assertion, and represented himself as of noble but inferior and less invidious parentage. From Epirus he had taken ship as if for Italy, while the emperor was duly apprised by his lieutenants that he might be expected to arrive there. This, according to some accounts, was the last that was publicly heard of him: other writers, however, pretended to know for certain that he fell into the hands of the emperor, and was promptly destroyed.[1]

An impostor arrested and put to death.

[1] Tacitus (*Ann.* v. 10.) relates this occurrence towards the end of the year 784, while Dion (lviii. 25.) places it as late as 787, supposing, perhaps, that it could not have occurred before the death of the real Drusus.

Horrible end of the young Drusus.

The miserable ends of Drusus and Agrippina, which followed at no long interval, were possibly determined and hastened by this untoward event. When Tiberius perceived how easily even a false Drusus might lead a movement against him, he might be impelled at last to make his decision regarding the fate of the real one. What that decision would be could not be for a moment doubtful. The poor youth had been too fearfully wronged to be again trusted with liberty. Yet Tiberius must have regretted the step he had taken, at the suggestion of Sejanus, of alienating his innocent kinsman from him. It was not that he wished to clear the field of promotion for a grandson by the removal of his grand-nephews. To Caius, the youngest son of Germanicus, he was at the moment displaying the highest favour, while he kept his mother and brother in such cruel durance. To the stripling Caius he seemed already to hold out the prospect of succession: he bred him under his own eye at Capreæ; he kept him in close attendance on his person, and gave him in marriage one of the noblest maidens of the city, the daughter of M. Junius Silanus.[1] It was rumoured, not unnaturally, that he was about to reconcile himself to the surviving members of his nephew's family, to atone for the death of Nero by the release and reinstatement in their proper honours of Drusus and Agrippina. But the relentless monster had determined far otherwise. Not only had he destined Drusus, after three years' confinement, to death, but he allowed him to perish in lingering torment by withholding from him necessary food. On the subject of death by starvation the Romans seem to have had a peculiar feeling which we can

[1] Suet. *Calig.* 12.; Tac. *Ann.* vi. 20. M. Junius Silanus was the brother of Decimus Silanus, the paramour of the younger Julia.

hardly understand. In many cases of suicide which occurred about this period, we find the sufferer choosing rather to perish miserably by inanition than to give himself a blow. More particularly we may observe in the imperial murders which have been recorded, that the victim was often left to die of mere want, and untouched by the sword. A superstitious notion may have been current that death by famine was a kind of divine infliction; it might seem like simply leaving nature to take its appointed course. The Romans were so familiar with the practice of exposing infants, and even the infirm and old among their slaves, that they may have regarded with some lenity the crime of murder in this, as they deemed it, extenuated form. It was merely, forsooth, leaving to the care of the gods those whom it was inconvenient or impolitic to care for oneself. Tiberius, with a bluntness of perception which seems almost inconceivable, addressed a letter to the senate, detailing in the minutest way the circumstances of this miserable death, showing how the poor wretch had prolonged his existence for nine days by gnawing the stuffing of his pallet, and recording every sigh and groan he had uttered, even to the last desperate imprecations he had heaped on his tormentor. Every syllable was duly vouched by the testimony of slaves, who had been set to watch his last moments. It is impossible to believe that this was a mere wanton piece of unnatural cruelty. It must have had a political purpose; and we may conjecture that it was meant, first, to establish on unquestionable testimony the actual decease of Drusus; and, secondly, to prove that no drop of the Julian blood had been shed, no spark of his divine spirit extinguished, by the hand of the executioner.[1]

[1] Tac. *Ann.* vi. 24.; Suet. *Tib.* 65.; Dion, lviii. 13. (A.U. 786, A.D. 33).

Agrippina starves herself.

The senate shuddered, we are assured, with horror at the recital of this abominable epistle; but the persecution of the house of Germanicus had not yet reached its climax. After the downfall of Sejanus, in whom she recognised her fiercest enemy, Agrippina may have allowed herself to indulge fresh hopes. But it soon became only too manifest that the crimes of Sejanus, by which she had herself so grievously suffered, were made a pretext for cruelties with which they had no connexion, and that the exasperation of the emperor against his old minister would bring no alleviation to the lot of that minister's victims. She continued to linger in cheerless exile: whether in that solitude she was afflicted with the intelligence of her two elder sons' miserable end, or suffered to learn the favour with which her youngest was at the same time entertained, she seems in either case to have soon despaired for herself, and to have resolved to escape by her own deed from miseries which were now past relief. It was reported that she put an end to her own existence by pertinacious abstinence from food, in spite of the emperor's command that nourishment should be forced upon her; an act of fortitude not unworthy of her determined and vigorous character. Even after her death Tiberius was base enough to insult her memory, by charging her with a criminal amour, and insinuating that she had abandoned life in disgust and mortification at the execution of her lover Asinius. The common voice of her fellow-citizens, not too prone to believe in virtue, absolved her from this foul accusation; her faults were not those at least of feminine weakness, and had her chastity been assailable, it would not perhaps have withstood the artifices of Sejanus.[1] Nevertheless,

[1] I will not dwell upon the faults of Agrippina; but it must be observed that even Tacitus represents them in very strong language:

that her memory might be branded with ignominy, Tiberius required the senate to pronounce the anniversary of her birth a day of evil omen, and to note in the calendar as a providential coincidence that her death had occurred on the day of the punishment of Sejanus. He claimed credit for himself that he had not taken her life by violent means, and had forborne from exposing her body in the Gemoniæ. The senate acquiesced and applauded as it was required, and decreed solemn thanks to the emperor for his clemency; moreover, that a yearly festival should be celebrated on the auspicious eighteenth of October. The remains of Agrippina and her children were excluded from the mausoleum of the Cæsars, until Caius at a later period caused them to be exhumed from their ignoble sepulchres and removed to the resting-place which became them.[1]

Massacre of the proscribed friends of Sejanus.

The prosecution meanwhile of the friends of Sejanus had continued unabated, the emperor vying with his own creatures and flatterers in discovering matter of accusation against every one who could be proved or credibly suspected of participation in his guilt. But Tiberius had actually shed the blood of a few only: his victims were quartered as captives on the magistrates and nobles, or confined, perhaps, in stricter durance within his own palace. Some of them had been plundered and reduced to beggary; some, perhaps, had been tortured; some were guilty, but their lives protected by their powerful connexions; others, unquestionably innocent, might be personally obnoxious. Tiberius was harassed by the anxiety of determining how to ap-

"Æqui impatiens, dominandi avida, virilibus curis fœminarum vitia exuerat."

[1] Tac. *Ann.* vi. 25. Agrippina died on the 18th of October, 786, two years after Sejanus. Comp. Suet. *Tib.* 33, 54.; *Calig.* 15.; Dion, lviii. 22, lx. 3. The bones of Drusus only were dispersed and could not be recovered.

portion their punishments; whom it might be safe to pardon, and whom it would be invidious to destroy. Suddenly the tyrant was seized with a horrid caprice, a fit, it may be, of madness, on the verge of which his unquiet brain was ever trembling, and he conceived the idea of relieving himself from his perplexity by a single stroke of the pen. He issued an order, such as there was no parallel for in his previous policy, and such as, in one so little wont to initiate a novelty either in counsel or in act, can hardly be ascribed to anything but uncontrollable frenzy, that all the captives of the Sejanian conspiracy should at once be put to death as traitors. The order was executed without compunction. Not men only, but women; not adults only, but children, were involved in the frightful massacre: some were noble, many of baser birth; in some places they perished singly, in others they fell in promiscuous slaughter one upon another. The mangled bodies were exposed in the Gemoniæ, and guards were placed around to drive away their mourning relatives, or to watch and report their lamentations. After some days' exposure the remains were dragged to the river bank and flung into the stream, and even those which were cast back upon the land were forbidden the rites of sepulture. The common duties of humanity, says Tacitus, were abandoned in the general terror; and all natural compassion cowered in silence beneath the tyranny that reigned rampant in every quarter.[1]

[1] Tac. *Ann.* vi. 19. Comp. Suet. (*Tib.* 61.), who, however, specifies twenty as the greatest number that fell, at least on any one day, and the massacre probably passed off in a single paroxysm. The language of Tacitus, it may be presumed, is considerably exaggerated. But Lucan's tableau of the proscriptions is not improbably coloured from the account he had himself heard from the witnesses of this dreadful sacrifice (ii. 191.):

"Nobilitas cum plebe perit, lateque vagatur
Ensis, et a nullo revocatum est pectore ferrum . . . .
. . . . nec jam alveus amnem,
Nec retinent ripæ, redeuntque cadavera campo."

It has been suggested that there may have been a touch of insanity in the conduct of Tiberius at this period, and certainly there is something more than the mere atrocity of the acts themselves to countenance a supposition which may afford, perhaps, a slight relief to the mind of the reader. The blood of the Claudii, as we have before noticed, was tainted, apparently through many generations, with an hereditary vice, sometimes manifesting itself in extravagant pride and insolence, at others in ungovernable violence; and the whole career of Tiberius from his youth upwards, in its abrupt alternations of control and indulgence, of labour and dissipation, had been such in fact as might naturally lead to the unsettlement of his mental powers. This inward disturbance showed itself in a very marked manner in the startling inconsistency which became now more and more apparent in his conduct. While at this period Tacitus denounces in the most glowing terms the vehemence and recklessness of his cruelty, the particular anecdotes he relates of his behaviour are generally indicative of transient fits of leniency. He was extremely sensitive, says Suetonius, to the pasquinades which circulated against him in the capital, to the imputation freely cast on him of degrading and secret enormities, and to the furious invectives of his perishing victims. The king of the Parthians had the audacity to address him a letter, in which he noted with disgust his indolence and shameless indulgences, and urged him to satisfy by a voluntary death the sentiment of universal execration. Yet these charges and insults Tiberius himself freely published to the world at the very time that he complained so bitterly of them: no man could say worse things of him than he spontaneously and consciously admitted of himself in the extraordinary revelations he made of his own feelings. At last, we are told, he fell into a state of disgust and des-

Despair and apparent insanity of Tiberius.

peration. A letter he addressed to the senate has been in part preserved to us by his awe-stricken contemporaries, whom it deeply impressed, breathing as it does the very spirit of incipient madness in the terrors of a distressed conscience, unable to fasten on the precise and proper object of its perturbation. *What to write to you, Fathers, at this juncture,* he said, *or how not to write, or what to forbear from writing, the Gods confound me worse than I feel day by day confounded, if I know.*[1] So had his crimes and abominations, says Tacitus, redounded to his own punishment. *Nor in vain,* the historian goes on to moralize, *was the wisest of philosophers wont to maintain that, could the hearts of tyrants be opened to our gaze, we should behold there the direst wounds and ulcers; for the mind is torn with cruelty, lust, and evil inclinations, not less truly than the body by blows.*[2]

His mortification at the suicide of Cocceius Nerva.

The despair of the now miserable tyrant is hardly less strongly marked in his distress at the circumstances of the death of an attached adviser and servant, Cocceius Nerva, a man held in high repute as a legal authority, and one whose character and attainments were among the most respectable supports of the Cæsarean government. The fortunes of Nerva were flourishing in the full sunshine of his master's favour; his health of body was unimpaired, and his mind mature and vigorous: he had no outward cause of chagrin, none of apprehension for the future. Yet this man, it was announced, had formed the resolution of terminating his own existence; for it had become the fashion to make an avowal to one's friends and

[1] Tac. *Ann.* vi. 6 under the date 785: "His verbis exorsus est, Quid scribam vobis, P.C., aut quomodo scribam, aut quid omnino non scribam hoc tempore, Di me Deæque pejus perdant quam perire me quotidie sentio, si sciam."

[2] Tac. *Ann. l. c.* from Plato, *de Republ.* p. 575.; Ritter *in loc.*

family of such an intention. Tiberius sought the suicide's chamber, where he was calmly awaiting, in discourse with his friends and relations, with resolute refusal of all sustenance, a slow and painful death. Tiberius entreated him to explain the motive of this desperate determination, to which, however, the sufferer could not be persuaded to return a distinct answer. With friendly zeal he solicited him to desist from it, but again without success. Lastly, he urged how injurious it would be to his own reputation as emperor, if one of his nearest intimates should thus make, as it were, his escape from life without even assigning a motive to allay the agitation of the public mind. Nerva calmly waived all discussion upon the subject, and the all-powerful ruler found himself repulsed and impotent in the presence of one who had sentenced himself to death. Those who were best acquainted with the real sentiments of the suicide averred that the melancholy state of affairs had filled the sage's mind with alarm and indignation, and that he had deliberately resolved to shun the future with honour, while still uninjured and unassailed.[1]

Nor, it may be believed, did the example of Nerva remain without imitators. None of them, however, was so illustrious as L. Arruntius, a noble, as we have seen, so distinguished in character and position that Augustus had not omitted to note him among those chiefs of the senate who might, as he said, have contended with his own heir for the empire. This man, however, notwithstanding this invidious distinction, and in spite of the crabbed humour with which he had ventured to gibe at the emperor himself, had escaped unharmed almost to the last year of Tiberius. Yet from the fortitude of his crowning act we may believe that he

Voluntary death of Arruntius.

[1] Tac. *Ann.* vi. 26.

had merited this escape by no unworthy compliances: he had merely abstained from irritating his master's jealousy by measuring himself with him in overt opposition. On the occurrence of a disastrous inundation, it was to Arruntius that the task was assigned of providing for the future security of the city, which involved perhaps some arbitrary interference with the rights of property, of which the Romans, however great the necessity for it might be, were always excessively jealous. At one period Tiberius proposed to remove him from Rome by the honourable appointment of a government in Spain; but again, unable to prevail on himself to entrust a possible rival with so much power, he had kept him by his own side in the capital, requiring him to execute his office by the hands of legates. The delators had been eager to fasten a charge upon one who stood so exposed to their aim; but he had defeated at least one accusation, and secured the punishment of his assailants. At last, however, he was more fatally involved in a charge brought against a certain Albucilla, the wife of Satrius, the denouncer of Sejanus. Treasonable practices, impiety, as it was phrased, against the emperor, had been alleged against her; and as the looseness of her conduct was notorious, the known or supposed partners of her debauchery were presumed from that circumstance to be concerned also in her disloyalty. Among these was Arruntius; but so little could be really advanced against him, or so adverse or indifferent was Tiberius to the prosecution, that the accused were permitted to remain at large with only a vague charge hanging over them. Some of them by merely keeping quiet escaped all further animadversion. The friends of Arruntius would have persuaded him to rely on the emperor's clemency, and make no movement on his own part. But he proudly refused to owe his safety to an evasion.

The same conduct, he declared, *does not become all men alike. I have lived long enough. I have nothing to regret but having endured life so long amidst so many insults and dangers, exposed as I have been to the arrogance formerly of Sejanus, and now of Macro*:—for Macro had by this time become almost as obnoxious as his predecessor.—*True, I might perhaps still secure myself for the brief period which yet remains to the aged emperor; but how could I hope to escape intact through the reign of his successor?* With these words he caused his veins to be opened, and allowed himself to bleed to death. He foresaw a more intolerable servitude impending, and resolved to flee alike from the recollection of the past, and the prospect of the future. Though Arruntius himself might have escaped on this occasion, Albucilla was eventually condemned and executed; while those of her accomplices were selected for banishment or disgrace who were most obnoxious for their crimes, and particularly for that of delation.[1]

Reflections on the policy of Tiberius.

In the midst of his terrors and his cruelties Tiberius was distressed and perhaps amazed at the evidence these deeds afforded of the horror in which his government was now held. If in the proscription of all, even of his nearest kin, who had seemed to menace his power, he had shown himself sanguinary and relentless, yet these were but few in number; they belonged, moreover, as he might presume, to a class too far exalted above the mass even of the nobles of Rome to excite much general sympathy. Why, he might ask, should the Romans interest themselves in mere family quarrels, and the bootless question, which candidate for the tyranny should actually climb the throne? But, on the other hand, he may have flattered himself that in the

[1] Tac. *Ann.* vi. 47, 48. under the year 790.

punishment of many bad citizens, by which his reign had been distinguished, he had shown a sense of equity and public spirit. Every Roman was concerned in his overthrow of an upstart like Sejanus; in the just retribution he had launched at the detestable delators, the foes not of the prince but of the people themselves; in the high moral feeling he had displayed in chastising the vices of women of quality; in pronouncing sentence on an Albucilla, a Claudia, an Urgulania, and recently on Plancina: for the wife of Cnæus Piso, though long protected, first by the favour of Livia, and still later by the disinclination of Tiberius to give a triumph to Agrippina, had at last been sacrificed to the unappeased enmity of the citizens. He might affect to plead for himself, as his successor afterwards pleaded for him, that it was not he that had warred against the senate, but the senators against one another. Of the four great nobles indeed whom Augustus specified as not unfit to compete with him for empire, three had since perished by violent deaths. Nor can Tiberius himself be relieved from the guilt of effecting the death of Asinius Gallus. Of neither Piso, however, nor Arruntius could it be said that he had devised and compassed his destruction; and the consideration in which Lepidus continued to be held shows that the highest rank and position were not necessarily fatal to their possessor.[1] M. Æmilius Lepidus, the son of Æmilius Paulus and a Fausta Cornelia, who thus combined in his origin descent from the most illustrious of the Roman houses, might have considered himself a far

[1] These four nobles are here mentioned together, because Tacitus leaves it uncertain whether Cnæus Piso or Arruntius was one of the three especially designated by Augustus. "De prioribus (*i.e.* Gallus and Lepidus) consentitur: pro Arruntio quidam Cn. Pisonem tradidere." He adds, untruly as we have seen: "Omnesque præter Lepidum, variis mox criminibus, struente Tiberio, circumventi sunt." *Ann.* i. 13.

greater man than any Octavius or Antonius, and have looked down with complacent superiority upon even a Julius or a Claudius. But this distinguished noble had acquiesced in the choice, if such we may call it, of the Roman people; taught by the insignificance into which his kinsman the triumvir had fallen, that the day of great names had passed, that the nobles were unworthy to bear rule and the people incompetent, he had suffered the chief of the Claudii to take precedence of him in the senate; and while occupying himself the second place, he had used his influence discreetly and liberally, and had succeeded more than once in tempering the severity of his colleagues.[1] Another of the notabilities of the preceding reign, who had also retained his honours under Tiberius, was Lucius Piso, chief pontiff and prefect of the city, a man of ability without ambition, who had discharged the functions of a difficult post with tact and considerateness, while in the senate his voice had always been given on the side of justice, and when that was defeated, had at least recommended moderation.[2] Such were the men who, without despairing of their position, and flying to death or retirement, could find a sphere for their virtues even under the strong constraint of the imperial government; and from more than one passage of Tacitus, severe as he is in judging the crimes and policy of Tiberius, it appears to have been well understood among the nobles, that *even under bad princes there is still a sphere for great men;*

[1] For instances of the influence of Lepidus, see Tac. *Ann.* iii. 50., iv. 20.

[2] Vell. ii. 98.; Tac. *Ann.* vi. 10.: "L. Piso pontifex, rarum in tanta claritudine, facto obiit" (ann. 785): "nullius servilis sententiæ sponte auctor, et quotiens necessitas ingrueret, cupienter moderans . . . Ætas ad octogesimum annum processit . . . . præcipua ex eo gloria quod præfectus urbi recens continuam potestatem et insolentia parendi graviorem, mire temperavit." For the scandalous charges against the prefect Piso, see above, chap. xliv.

that loyalty and moderation combined with industry and vigour obtain the more genuine honour, from the proneness of the proud and turbulent to rush on certain ruin without advantage to any.[1]

Question of succession to the empire.

It may be true that Tiberius, in one of his gloomiest moods, dissatisfied with himself yet indignant at the dissatisfaction of his people, actually gave vent to his vexation in the memorable quotation from a tragic writer, *After my death perish the world in fire.*[2] But the same sentiment has been ascribed to other tyrants in later times, and may be regarded as expressive merely of the judgment mankind in general have formed of their extravagant selfishness. As regards Tiberius, indeed, it may have been put into his mouth by a later generation which had suffered under the sway of successors even worse than himself, and believed that in consigning them to such ruthless rulers he had evinced a wanton indifference to their misery, if not rather a fiendish exultation in it. But our estimate of the conduct of Tiberius in this particular must be founded on a fair consideration of the circumstances in which he was placed. We must not suffer ourselves to be biassed by the notions of a later age, to which the principle of direct appointments had become familiar. After weighing the statements of different writers, we shall see reason probably to accede to that of Tacitus in preference to others, according to whom Tiberius made no appointment, designation, or recommendation of a successor to the imperial prerogatives. He could not have done so without directly violating the settled principle of his government, which he pre-

[1] Tac. *Ann.* iv. 20.; *Agric.* i2.

[2] Dion. lviii. 23.: *τοῦτο τὸ ἀρχαῖον ἐμοῦ θανόντος γαῖα μιχθήτω πυρί.* See the allusions to the sentiment in the ancients, Cic. *de Fin.* i. 19.; Senec. *de Clem.* ii. 2; Suet. *Ner.* 38.; Claudian *in Rufin.* ii. 19. in Reimar's note. Comp. Suet. *Tib.* 62.: "Identidem felicem Priamum vocabat, quod superstes omnium suorum exstitisset."

tended to found on the spontaneous concession of the people. The establishment of monarchy was not even yet recognised as a constitutional fact. The chief of the Julii might appoint, like any private citizen, the heir to the domestic rites and honours of his house; but this inheritance conveyed no title to the Imperium or Principate, the Consular or the Tribunitian power. Herein lay, as Tiberius was well aware, the secret of the new government's weakness: this uncertainty as to the future was the main cause of the tyranny into which he had himself insensibly lapsed. No greater blessing could have been bestowed on the Romans by a wise and honest ruler than the transmutation of their polity from a pretended commonwealth to an acknowledged monarchy. But dire experience had not yet perhaps taught them to acquiesce in the assumption by their dying chief of a power over their political future. Would they respect his disposition of their indefeasible prerogatives after his decease? Would they not, on the contrary, resent it? This was a question which Augustus had not ventured to ask. Yet the founder of the empire had been too deeply interested in the success of his work to leave its prospects to blind chance. He had shown himself anxious, during his own term of government, to pave the way for the recognition of his intended successor, by gradually investing the proposed heir of his private fortunes with public honours and titles akin to his own; so that Tiberius had been able, on his father's decease, to glide, almost unobserved, into the sovereign power. Such undoubtedly was the generous policy which became a ruler to whom the interests of the state were really dear, and who sought to found the greatness of his own house on the prosperity of the people. But to such a policy the spirit of Tiberius was not perhaps equal. A cruel misfortune had deprived him of Germanicus; but so had Augustus also lost his Agrippa. Drusus was removed from him

by the treachery of an unworthy favourite; but in like manner his predecessor had had to mourn the early and ill-omened loss of Caius and Lucius. Here, however, the parallel ceased. While the first princeps continued after every disappointment to repeat his genuine efforts to secure the principles of family succession, and called Tiberius himself, in default of still nearer kinsmen, into alliance and partnership in the empire; the second sacrificed all to an unworthy jealousy, and chose rather to murder his nephews than to risk being supplanted by them.

Surviving members of the imperial family.

Accordingly, towards the end of his career, Tiberius found himself supported by only three surviving males of the lineage of Cæsar, and none of these had received any training in public life. Tiberius Claudius Drusus, born in the year 744, was the last of the sons of the eldest Drusus, and the nephew of the reigning emperor, by whom he had been adopted on his father's death, at the desire of Augustus. But Claudius (to give him the name by which he will become familiarly known to us) was reputed to be infirm both in health and understanding. Like Agrippa Postumus, he was destined from early youth to be excluded from public affairs, and all political instruction had been purposely withheld from him. Yet he was not perhaps destitute of talents; he devoted himself to the study of books, and possibly he appreciated them, while the weakness of his bodily frame contributed to keep him from the rudes and coarser diversions, to which the want of practical employment might have driven a bolder and more vigorous man. His character and attainments, however, we shall have a future occasion to estimate more precisely: for the present it is enough to say that he had probably owed his life, amidst the fall of so many of his relations, to the general conviction that he was unfit to rule, and therefore not to be feared as a candidate for the suffrages of the people.

Upon him the emperor scarcely deigned to bestow a thought at this crisis. Two others, however, there were, both much younger than Claudius, between whom the hopes of the Julian house were divided; Caius, the youngest son of Germanicus, and Tiberius, surnamed Gemellus, the child of the second Drusus; the one grand-nephew, the other grandson, of the emperor, but both equally reputed his sons or grandsons by adoption.[1] Of these Caius was born in the year 765, Tiberius in 772.[2] The former had been enrolled at an early age among the augurs and pontiffs, and had since been advanced to the quæstorship, the first step in the legitimate career of honours; the latter had not yet been introduced into public life, his tender years hardly permitting it. From neither of these striplings certainly could the emperor anticipate any rivalry with himself; but untried and almost unknown as they still were, he shrank from insulting even his subservient senate by claiming for them the highest prerogatives. The daughters of Germanicus he had married to citizens of distinction. Julia was united to Vinicius, whose municipal and equestrian extraction had been recently illustrated by the rise of both his father and grandfather to the consulship.[3] Drusilla had wedded a Cassius, whose family was plebeian, though it vied with the noblest of Rome in antiquity and reputation, besides the peculiar lustre which had been shed upon it in more recent times.

[1] It has been mentioned before that Agrippina had borne five sons and four daughters to Germanicus. The deaths of Nero and Drusus have been recorded in their place: two other sons seem to have died in infancy. Caius, the youngest of the five, was now the sole survivor.

[2] This Tiberius had also the name of Gemellus, which seems to show that he was one of the male twins whom Livilla bore to Drusus in the year 772. Tac. *Ann.* ii. 84.; see above, chap. xliii. The other child, as has been said, probably died in infancy.

[3] Tac. *Ann.* vi. 15. Vinicius, the patron of Velleius Paterculus, was probably an adherent of Sejanus, and owed his alliance with the Cæsarean family to the favour of so powerful a friend.

A third daughter, who bore her mother's name, Agrippina, was affianced to a man of higher rank than either of these, a Cnæus Domitius Ahenobarbus, descended lineally from the three Domitii whose names have been successively signalized in these pages. A fourth, whose name has not been recorded, was united to the son of Quintilius Varus. Again, after the death of her husband Nero Germanicus, the younger Julia, daughter of Drusus and Livilla, had been espoused to Rubellius Blandus, a second connexion which might properly be regarded as an unworthy descent from the first, inasmuch as his nobility dated only from the last generation.[1] But in casting his eyes on these and perhaps other scions of the old aristocracy, Tiberius could discover none whose eminence entitled him to be exalted above all the rest of his order; the levelling effects of his tyranny were already manifest in the general mediocrity of talent in the senate, and the public mind was not unprepared to admit the rule of hereditary succession as a state necessity.

Tiberius appoints Caius and Tiberius Gemellus heirs of his private fortune. A. D. 35. A. U. 788

The bitterest of Tiberius's enemies admits, not as it would seem without some inconsistency, that he was anxious at heart to settle the succession on a secure footing, and would have disregarded, in making his choice, the opinion of his contemporaries, could he have felt assured of the approbation of a grateful posterity. Nevertheless, after much restless

[1] Tac. *Ann.* vi. 27.: "Cujus avum Tiburtem equitem Romanum plerique meminerant." Juvenal (viii. 39.) employs the name of Rubellius to represent the pride of those who have greatness thrust upon them:

"Tecum est mihi sermo, Rubelli
Blande: tumes alto Drusorum stemmate tanquam
Feceris ipse aliquid propter quod nobilis esses.
Ut te conciperet quæ sanguine fulget Iuli;
Non quæ ventoso conducta sub aggere texit."

Domitius, Vinicius, Cassius, and Rubellius are mentioned together in *Ann.* vi. 45. as the four progeneri, grandsons-in-law, of Tiberius.

deliberation, the failing old man was constrained to leave it in all the uncertainty above described: he *abandoned to fate*, says Tacitus, *the decision to which he was himself unequal.*[1] But already in the year 788 he had made a testament, appointing Caius and Tiberius co-partners in his private heritage, with whatever advantage might thence accrue to them in regard to their public pretensions; and in the event of the death of either, the survivor was destined to inherit from the deceased.[2] The elder of the two princes at least was not unmoved by the prospect of the fortunes which seemed so likely to befall him. Caius was not insensible to the advantage he enjoyed in popular favour, and especially among the soldiers, as the son of Germanicus. Though actually born in the peaceful retirement of Antium, he had been carried in infancy to the stations of the Rhenish legions, and bred up in the midst of the soldiery, and he gladly countenanced, we may suppose, the common belief that he had first seen the light in the camp.[3] As a child, he had been accoutred in the military garb, and it was from the boots, or caligæ, which he was made to wear, that the soldiers gave him his familiar nickname of Caligula.[4] The mutiny on the Rhine was actually

Caius Germanicus Cæsar, nicknamed Caligula.

[1] Tac. *Ann.* vi. 45.: "Quippe illi non perinde curæ gratia præsentium quam in posteros ambitio: mox incertus animi, fesso corpore consilium, cui impar erat, fato permisit."

[2] Suet. *Tib.* 76.

[3] Suet. *Calig.* 8.: "Ubi natus sit incertum diversitas tradentium facit. Cn. Lentulus Gætulicus Tiburi genitum scribit; Plinius Secundus in Treveris, vico Ambiatino, supra confluentes .... Versiculi, imperante mox eo divulgati, apud hibernas legiones procreatum indicant:

In castris natus, patriis nutritus in armis,
Jam designati Principis omen erat.

Ego in actis Antii editum invenio."

[4] Tac. *Ann.* i. 41.; Dion, lvii. 5.; Suet. *Calig.* 9.: "Caligulæ cognomen castrensi joco traxit, quia manipulario habitu inter milites

quelled, it was said, by showing to the troops their young pet and playfellow. But these rude caresses were not, as he early learnt, to be accepted without danger, and he was careful to disguise the pleasure he took in the favour in which the citizens held him. Nor less anxiously did he conceal any emotions of an opposite character, which the sufferings of his mother or brothers may have awakened in his breast. A practised dissembler from his early years, for from the first dawn of consciousness he found himself the inhabitant of a palace, and closely attached to the person of the all-dreaded imperator, he studied to clothe his countenance day by day with the expression assumed by Tiberius himself, to penetrate his sentiments and echo, as it were, his very words. He was ever on the watch to anticipate the wishes of the tyrant, and at a later time, the remark of the orator Passienus obtained a great success, that no man was ever a better servant, or a worse master.[1]

Macro obtains ascendancy over him. A. D. 36. A. U. 789.

Caius Cæsar, by the direction of his grandsire, had married in 786 Claudia, or Claudilla, the daughter of M. Junius Silanus; but this consort he had lost in the third year of their union.[2] At this latter period the end of Tiberius was visibly approaching. While his bodily strength was failing his mind continued unimpaired, and the power as well as the habit of dissimulation retained its full vigour to the last. No consciousness of his own decay could extort from him

educabatur . . . . post excessum Augusti tumultuantes . . . . solus haud dubie conspectu suo flexit."

[1] Tac. *Ann.* vi. 20.: "Immanem animum subdola modestia tegens . . . qualem diem Tiberius induisset, pari habitu, non multum distantibus verbis. Unde mox scitum Passieni oratoris dictum percrebuit; neque meliorem unquam servum, neque deteriorem dominum fuisse."

[2] Tac. *Ann.* vi. 20. Suetonius (*Calig.* 12.) gives her name more correctly, Junia Claudilla. Dion is inaccurate in placing the marriage in 768.: lviii. 25.

any disclosures of his actual views regarding the imperial inheritance. The ambitious and intriguing spirits at Rome trembled in uncertainty as to the future, and Tiberius kept his courtiers still attached to his side by refusing to indicate by word or gesture in what quarter they should look for his successor. He even let it be supposed, it would seem, that, dissatisfied with the prospect opened to him within the limits of the Cæsarean family, he meditated removing both the grandson and the grand-nephew by death.[1] Nevertheless the arts of the veteran dissembler could not blind the wariest of his observers. Since the overthrow of Sejanus, the bold and crafty Macro had wielded no small share of that minister's power, but he had never succeeded in gaining the personal favour and confidence of his master. Though at the head of the prætorians and of the police of the city, he had not been advanced to the more brilliant honours of the state. For these he must be content to look to the exigencies of a new reign, in which his talents and position might command still higher promotion; and it was now his object to divine the future emperor, and bind him to himself by some signal service. As shrewd in observation as he had proved himself bold in action, he fixed without hesitation upon Caius as the destined chief of the state. To secure an ascendancy over him he employed the artifices of his wife Ennia, who insinuated herself into the affections of the young and idle voluptuary at a moment when his fancy was unoccupied, and soon acquired for her husband all the influence he desired. *You leave the setting sun to court the rising,* muttered Tiberius, whom nothing could escape: but he gave no further token of displeasure, and the people accepted the words, which were speedily noised abroad,

[1] Suet. *Tib.* 62.

as an intimation that already in his own mind he had determined to transmit the empire to his grand-nephew. Another sentence, which was ascribed to him, seemed not less significant of this intention Observing one day a cloud pass over the countenance of Caius, on his making a gesture of kindness towards the young Tiberius, for whom he seems to have felt some yearning of natural affection, he was reported to have said to him, *you will kill him, and another will kill you.*[1] The young dissembler had never been able to impose on his uncle's practised sagacity. Tiberius had observed, not, it is said, without a malignant satisfaction, the gross sensuality and cruel or degrading sports in which he delighted, hoping, as was commonly surmised, that they would divert him from the aspirations of a premature ambition, expecting, as some ventured to suggest, that the crimes of the ensuing reign would extinguish the recollection of his own.[2]

Ideas regarding the disposal of the succession: expression of Tacitus.

Tacitus, as we have seen, assures us that Tiberius abandoned the imperial succession to fate; by which he evidently means that the emperor addressed no direct injunction or recommendation to the senate upon a subject on which, as he well knew, he could exercise no real authority. In the phrase itself, the current language of the philosophy of the time, there is nothing remarkable; nor do I imagine that there is any allusion in it to the story upon this subject narrated by Josephus, which deserves, however, to be recorded in illustration of the character of the age. Tiberius, says the Jewish historian, on his return to Capreæ from his last visit to the continent, was seized with a consumptive attack, which at first

Anecdote told by Josephus.

[1] Tac. *Ann.* vi. 45.: "Occides tu hunc, et te alius." Dion, lviii. 23. Comp. Philo, *l. c.*

[2] Suet. *Calig.* 11.; Dion, lviii. 23.

did not threaten danger: but as the disorder gained ground he began to feel that his end was actually approaching; whereupon he commanded Euodus, the most confidential of his freedmen, to send his two grandchildren to him betimes the next morning, that he might address them before he died. After giving this direction, he prayed the gods to make known to him by some token which of the two they destined to succeed him: for although his wish was to leave the empire to the young Tiberius, he felt that his own inclination ought to yield to the manifestations of the divine will. Accordingly he proposed to himself a sign by which that will might be discovered; and this was, that whichever of the princes should first come into his presence, him he would regard as called to the empire. Having thus piously placed himself in the hands of the gods, he proceeded, with a natural inconsistency, to control, if possible, their decrees, by desiring the tutor of Tiberius to make sure and bring his charge at the earliest hour possible. But this prince, spending some time over his morning meal, was actually forestalled by Caius, much to the emperor's regret, who was moved to tears at the unhappy fortune of his own offspring, not only excluded by providence from the sovereign power, but exposed, as he well knew, to the direct risk of destruction. Commanding himself, however, with a great effort, he said to Caius, *My son, although Tiberius is nearer to myself than you are, yet both of my own choice, and in obedience to the gods, into your hands I commit the empire of Rome.* To these solemn words he added, according to the same authority, an earnest entreaty that he would continue to love his unprotected kinsman, enforced by a warning of the perils of his own position, and of the pains which wait on human ingratitude.[1]

[1] Joseph. *Antiq. Jud.* xviii. 6. 9.

Last days of Tiberius.

Of all our principal authorities for the history of this period Josephus undoubtedly stands the nearest in point of time; nevertheless, bred as he was in the ideas of a foreigner or a provincial, his information on matters of constitutional principle is often at fault; and the anecdote just related is of little historical value, except as showing the more indulgent way in which the character of Tiberius might be regarded beyond the precincts of Rome or Italy. This writer is not indeed correct in the place he assigns for the death of the emperor, a point on which a Roman historian could hardly have made a mistake. It was early in the year 790 that Tiberius, now in his seventy-eighth year, quitted for the last time his retreat in Capreæ, and moving slowly from villa to villa, arrived within seven miles of the city on the Appian Way. Again, having taken one more view of its distant buildings, he turned his back finally upon them, terrified, so it was reported, by an evil omen, and retraced his languid steps along the coast of Campania.[1] At Astura he fell sick; but having a little recovered he proceeded onwards to Circeii. Here, anxious to avert suspicion of his illness, he not only presided at the exercises of the camp, but even cast javelins with his own hand at the beasts which were driven before his seat in the amphitheatre. By this exertion the old man both strained and overheated himself; yet, though his symptoms grew worse, he insisted on continuing his progress as far as Misenum, where he possessed the voluptuous villa of Lucullus; nor would he allow any change to be made in his sensual and perhaps intemperate habits at table.[2] His

[1] Suet. *Tib.* 72.: "Ostento territus."

[2] Suet. *l. c.* "Nihil ex ordine quotidiano prætermitteret, se convivia quidem ac cæteras voluptates, partim intemperantia, partim dissimulatione." But Pliny, in the passage before cited (*Hist. Nat.* xiv. 28), while he allows the intemperance of Tiberius in his youth,

courtiers and attendants looked on with awe and trepidation. Every one felt assured that the days of the tyrant were numbered; yet every one feared to pay his court too soon by a day or an hour to the expected heir of his fortunes. All eyes were turned on Charicles, the emperor's confidential physician; and Caius himself, perhaps, was the first to urge him to contrive to feel the dying man's pulse, for Tiberius persisted to the last in disguising his actual condition, and thus ascertain how much life was yet left in him. Charicles, it seems, was about to quit the court for a few days: possibly his master had dismissed him on purpose to blind the eyes of the watchful observers around him. Rising from the table, and taking the emperor's hand to kiss it, he managed to touch the wrist. Tiberius noticed the touch and immediately guessed its motive. He called for fresh dishes and more wine, nor would he consent to break up the festivities till a later hour than ordinary.[1] On rising he even received one by one the salutations of all his guests, according to his wont, keeping all the while an erect posture, and addressing to each a word in reply. But Charicles had attained his object, and his science was not to be deceived. He assured Macro that the patient could not survive beyond two days. Tiberius was the more anxious, it was said, to regain Capreæ, because he was offended at the neglect of the senate to expedite the condemnation of some criminals he had required it to sentence, and could not venture on a stroke of authority except from his inaccessible citadel. But whether or not this were so, his hopes and fears were all about

expressly declares that his abstemiousness was strict if not austere ("severus atque etiam sævus:" the words are perhaps corrupt) in this respect in his later years. Tac. *Ann.* vi. 50.: "Jam Tiberium corpus, jam vires, nondum dissimulatio deserebat: idem animi rigor; sermone ac vultu intentus, quæsita interdum comitate quamvis manifestam defectionem tegebat."

[1] Tac. *l. c.*: "Instaurari epulas jubet, discumbitque ultra solitum."

to close, and Capreæ he was destined never again to visit. Unfavourable weather combined with the advance of his malady to retain him at Misenum; and whether his dissolution was altogether natural, or hastened by foul means, as commonly suspected, it was not perhaps delayed beyond the term assigned to it by the physician. The actual circumstances of the tyrant's end were variously reported. On the 17th of the calends of April, or the 16th of March, says Tacitus, he had fainted away, and it was imagined he had ceased to breathe. The courtiers trooped without delay to congratulate Caius, who quitted the chamber to surround himself, as was supposed, with the ensigns of power, when suddenly it was reported that the sick man's voice and vision had returned, and he had called to his attendants for nourishment. The consternation was universal; the crowd hastily dispersed, and every man framed his countenance to a look of ignorance or anxiety. Caius himself was struck speechless in expectation of immediate punishment. But Macro was at his side, and Macro was resolute and prompt as ever. *Heap more bedclothes upon him*, he whispered, *and leave him.*[1] Tacitus insinuates without hesitation that he was stifled, and his account has been most commonly followed; he refers, however, to no authority.[2] On the other hand, a contemporary of the events seems to describe the old man's death as simply natural. Feeling himself sinking, said Seneca, Tiberius took off his ring, and held it for a little while, as if about to present it to some one as an instrument of authority; but soon replaced it on his finger, and lay for

His death.

[1] Tac. *l. c.*: "Cæsar in silentium fixus a summa spe novissima exspectabat: Macro intrepidus, opprimi senem injectu multæ vestis jubet, discedique a limine."

[2] Thus Dion, lviii. 28.: δείσας οὖν ἐκεῖνος μὴ καὶ ἀληθῶς ἀνασῳ ᾖ, οὔτε ἐμφαγεῖν τι αἰτήσαντι αὐτῷ, ὡς καὶ βλαβησομένῳ, ἔδωκε καὶ ἱμάτια πολλὰ καὶ παχέα, ὡς καὶ θερμασίας τινὸς δεομένῳ, προσέβαλε· καὶ οὕτως ἀπέπνιξεν αὐτὸν, συναραμένου οἱ αὐτῷ καὶ τοῦ Μακρωνος.

a time motionless: then suddenly he called for his attendants, and when no one answered, raised himself from his bed with failing strength, and immediately fell lifeless beside it.[1] This account was distorted by others into the denial of necessary sustenance, and actual death by exhaustion, while some did not scruple to affirm that Caius had caused him to be poisoned.[2]

The character of Tiberius not mysterious.

Cæsar, the high-handed usurper, met an usurper's death, by open violence in the light of day. Augustus, after fifty years of the mildest and most equitable rule the times admitted, sank at last by a slow and painless decay into the arms of those dearest to him, amidst the respectful sympathies of an admiring people. The end of Tiberius, whether consummated by treachery or not, was shrouded in gloom and obscurity; the chamber of mortality was agitated to the last by the intrigues and fears of the dying man and his survivors. The fellow countrymen of the detested tyrant seem to have deemed it fitting that one whose life was to them a riddle should perish by a mysterious death. For my own part, I would rather represent him as a man whose character was sufficiently transparent, whose apparent inconsistencies, often exaggerated and misrepresented, may generally be explained by the nature of his position, and the political illusions with which he was required to

[1] Suet. *Tib.* 73.: "Seneca eum scribit, intellecta defectione," &c. The elder Seneca, who is known to have written a history of his own times, died towards the end of Tiberius, at an advanced age. This must be the account of his son the philosopher; but there is no such passage in his existing works. Suetonius in another place (*Calig.* 12.) gives another account: "Caius veneno Tiberium aggressus est," &c.

[2] Tacitus gives March 16. for the date of this event. Dion, March 26. Tiberius, born November, 712, was in the middle of his seventy-eighth year. Dion, *l. c.*: *ἐβίω δὲ ἔτη καὶ ἑβδομήκοντα ἔτη, καὶ μῆνας τέσσαρας, καὶ ἡμέρας ἐννέα.*

encircle himself. It is the character of the age in which he was placed, an age of rapid though silent transition, rather than of the man himself, which invests him with an historical interest. This is the point to which it will be well to direct our attention, before letting the curtain drop on the personage with whom the forms of the republic perished, and the despotism of the Cæsars finally dropped its mask.[1]

Judgment of the Romans on the character of Tiberius.

The practice of delation, so rapidly developed under the rule of Tiberius, introduced a new principle into the government of his day, and marked it with features of its own. It is hardly possible to overrate the effects of this practice on the general complexion of the Roman polity, nor is it easy to exaggerate the horror with which it came to be regarded. It was an attempt to reconcile the despotism of the monarch with the forms of a republic; to strengthen the sovereign power by weakening its subjects; to govern the people by dividing them, by destroying their means of combination among themselves, by generating among them habits of mutual distrust and fear, and finally plunging them into a state of political imbecility. We have already seen how this system was in fact the product of peculiar circumstances rather than the creation of a deliberate will; nevertheless the chief of the state was made, not unnaturally, to bear the whole responsibility of

[1] Thus Ferguson concludes his history of the Roman republic with the death of Tiberius. Tacitus describes, according to his view, the different epochs in the character of Tiberius. *Ann.* vi. 51.: "Morum quoque tempora illi diversa: egregium vita famaque, quoad privatus, vel in imperiis sub Augusto fuit: occultum ac subdolum fingendis virtutibus, donec Germanicus ac Drusus superfuere: idem inter bona malaque mixtus, incolumi matre: intestabilis sævitia, sed obtectis libidinibus, dum Sejanum dilexit timuitve: postremo in scelera simul ac dedecora prorupit, postquam, remoto pudore et metu, suo tantum ingenio utebatur."

it, and the disgust of the nobler spirits of Rome at the tyranny of spies and informers was turned against the prince himself, in whose interest at least, if not at whose instigation, their enormities were for the most part perpetrated. If we examine the authorities for the history of the reign we have been reviewing, we shall find that those who were nearest to the times themselves have generally treated Tiberius with the greatest indulgence. Velleius Paterculus indeed, and Valerius Maximus, his contemporaries and subjects, must be regarded as mere courtly panegyrists: but the adulation of the one, though it jars on ears accustomed to the dignified self-respect of the earlier Romans, is not more high-flown in language and sentiment than what our own writers have addressed to the Georges, and even the Charleses and Jameses, of the English monarchy; while that of the other is chiefly offensive from the connexion in which it stands with the lessons of virtue and patriotism which his book was specially designed to illustrate. The elder Seneca, the master of a school of rhetoric, to which science his writings are devoted, makes no mention of the emperor under whom he wrote; but his son, better known as the statesman and philosopher, though he was under the temptation of contrasting the austere and aged tyrant with the gay young prince to whom he was himself attached, speaks of him with considerable moderation, and ascribes the worst of his deeds to Sejanus and the delators rather than to his own evil disposition.[1] In the pages of Philo and Josephus, the government of Tiberius is represented as mild and equitable: it is not till we come to Suetonius and Tacitus, in the third generation, that his enormities are blazoned in the colours so painfully

[1] Seneca, *Ep.* 21.; *de Benef.* iii. 26.; *Consol. ad Marc.* 15.

familiar to us. It will suffice here to remark that both these later writers belong to a period of strong reaction against the Cæsarean despotism, when the senate was permitted to raise its venerable head and resume a show at least of imperial prerogatives; when the secret police of Rome was abolished, delation firmly repressed, freedom of speech proclaimed by the voice of the emperor himself, and the birthright of the citizen respectfully restored to him. There ensued a strong revulsion of feeling, not against monarchy, which had then become an accepted institution, but against the corruptions which had turned it into tyranny; and Tiberius, as the reputed founder of the system of delation, bore the odium of all the crimes of all the tyrants who had succeeded him. Tacitus admits that the *affairs of Tiberius* were misrepresented during his power by fear, and after his death by spite: yet we cannot doubt that Tacitus himself often yields to the bias of his detractors, while Suetonius is at best indifferent to the truth.[1] After all, a sober discretion must suspend its belief regarding many of the circumstances above recorded, and acknowledge that it is only through a treacherous and distorting haze that we have scanned the features of this ill-omened principate.

The reign of terror at Rome.

Nevertheless, the terror which prevailed in the last years of Tiberius, to whomsoever it is chiefly to be ascribed, exercised a baleful influence over society at Rome, and shows by effects which are still discoverable that it has been but little exaggerated. It has left permanent traces of itself in the manifest decline and almost total

[1] Tac. *Ann.* i. 1.: "Tiberii Caiique, et Claudii, ac Neronis res, florentibus ipsis ob metum falsæ, postquam occiderant *recentibus odiis* compositæ sunt." There seems reason to believe that the hostility to Tiberius's memory increased rather than diminished in the course of the succeeding century.

extinction of literature under its pressure. The Roman writers addressed only a small class in the capital; to be popularly known in the provinces, to be read generally throughout the Roman world, was a privilege reserved for few, and anticipated perhaps rarely by any. Even in the capital the poet and historian composed their works for a circle of a few thousand knights and senators, for the friends and families of their own few hundreds of acquaintances, whom they invited to encourage their efforts by attending their recitations. The paralysis which benumbed the energies of the Roman nobility at this crisis of terror and despair, extended naturally to the organs of their sentiments and opinions. Its effect upon literature. Not history only and philosophy suffered an eclipse, but poetry also, which under Augustus had been the true expression of the national feelings, became mute when the feelings themselves could no longer be trusted with utterance. We have seen how Cremutius was subjected to persecution for pronouncing that Brutus and Cassius were the last of the Romans. A tragedian was accused, and if accused we may presume perhaps that he was condemned, for speaking evil of the king of men, Agamemnon; and various authors were assailed, and their writings sentenced to proscription; to whose recitations the last princeps had himself listened with indulgence.[1] The poems which were tolerated were generally the most trifling and perhaps licentious in character.[2] The sly irony of the fable, a style of composition adopted by slaves, and imitated from the servile Orientals, seems not unsuitable to these

[1] Suet. *Tib.* 61. It will be remembered by scholars that Atrides is the invidious nickname often applied by the poets to the Roman tyrants. Comp. Juvenal, iv. 65.: "Itur ad Atridem."

[2] Such seems to have been the character of the verses of Lentulus Gætulicus. Martial, *præf.* i.; Plin. *Ep.* v. 3.

perilous times.[1] The name of Phædrus belongs in all probability to the Tiberian period, but it is curious that no later writer for four centuries should have cared to notice him.[2] Similar or worse has been the fate of a more serious writer, Manilius, the author of an elaborate poem on Astronomy and its spurious sister Astrology, a theme of some danger under the circumstances of the times, but which he has treated with irreproachable discretion; it is owing perhaps to the disgrace under which the forbidden science fell that this innocent work lapsed into entire oblivion, and has escaped the mention of any writer of antiquity.[3]

No traces of it among the populace.

The deep gloom which settled on the face of higher society at Rome was heightened by its contrast with the frivolous dissipation of the populace, who though deprived of the glitter of a brilliant court, and surrounded by signs of mourning and humiliation among their natural leaders, not the less abandoned themselves to the sensual enjoyments which alone they relished, and rejoiced in their utter indifference to political principles, to parties and to men. They clamoured with exultation over the body of the traitor; nevertheless, *had the goddess Nursia*, says the moralist, *but favoured her Etruscan votary, had but the false intriguer circumvented the*

[1] Phædrus says of his own style of composition (*Prol. ad.* iii. 33.):

"Nunc fabularum cur sit inventum genus
Brevi docebo. Servitus obnoxia,
Quia quæ volebat non audebat dicere,
Affectus proprios in fabellas transtulit."

[2] Phædrus is supposed to have been a freedman of Tiberius. Seneca exhorts Polybius, a freedman of Claudius, to divert his mind by writing fables a few years later; but even then he calls this kind of composition, "Intentatum Romanis ingeniis opus." Senec. *Consol. ad Polyb.* 27. Martial (iii. 20.) alludes to a Phædrus, but not apparently as a fabulist. "An æmulatur improbi jocos Phædri?"

[3] In this total absence of the "testimonia veterum," the date of Manilius is ascertained from his allusions to the death of Varus (i. 897.), to Augustus as still living (i. 922.), and again to the island of Rhodes as the "hospitium recturi Principis orbem." iv. 764.

guileless old man, on the instant they would have been heard proclaiming Sejanus a Cæsar and an Augustus.[1] In the one class was abandonment of public life, shame, despair and suicide;—the intolerable evils of the time drove men not to religious consolations, but to a restless inquiry into the future, or a vain attempt to lull the sense of the present in philosophic apathy:—the other rushed headlong, hour by hour, to the baths, shows, and largesses, or shouted at the heels of the idol of the moment, or sighed and perhaps murmured at his loss, and speedily resigned itself to oblivion of the fitful emotion of the day.

General state of peace and security in the provinces.

We must be careful notwithstanding to observe that both the shame and the degradation were for the most part confined to the city and its vicinity, which lay in the very shadow of the despot. Tiberius was content to sacrifice Rome to the exigencies of his position; but he ruled the provinces on the whole in a Roman spirit, and maintained the dignity of the empire for the most part intact from the centre to the frontiers. The stability of the system, if decaying at the heart, might still be measured by the strength and solidity of its members. At no period did the bulwarks of the Roman power appear more secure and unassailable. The efforts of Drusus and his son to overpower the Germans on their own soil had been stupendous; they had wielded forces equal at least to those with which Cæsar had added Gaul to the empire, and yet had not permanently advanced the eagles in any direction. But, on the other hand, it was soon found that the Germans were only formidable under the pressure of an attack. When the assault relaxed, the power they had concentrated in resistance crumbled

[1] Juvenal, x. 74.: "Idem populus, si Nursia Tusco
Faveret, si oppressa foret secura senectus
Principis, hac ipsa Sejanum diceret hora
Augustum."

readily away. With the death of Arminius, all combined hostility to Rome ceased among them. They never dared to retort in concert the invasions under which they had suffered. Meanwhile the arts and manners of the South advanced incessantly among them; their political dissensions were fostered by the enemy, and in the weakness caused by mutual jealousy they turned with awe and wonder to the image of the immense and undivided empire, the skirt of whose robe trailed majestically on their borders. At the same time the long respite from military exactions allowed the pursuits of ease and luxury to fructify within the limits of the provinces. Gaul was no longer drained from year to year by the forced requisitions of men and horses, of arms and stores, which had fed the exhausting campaigns of Germanicus. Her ancient cities decked themselves with splendid edifices, with schools and theatres, aqueducts and temples. The camps on the Rhine and Danube were gradually transformed into commercial stations, and became emporiums of traffic with the north of Europe, where the fur and amber of the Hercynian forests and the Baltic coast were exchanged for wine and oil, or gold and silver, those instruments of luxury which nature was supposed, in mercy or in anger, to have denied to the German barbarians.[1] Such a state of affairs allowed the emperor to persist in his favourite plan of leaving the provincial governors for years unchanged at their posts. Each succeeding proconsul was no longer in a fever of haste to aggrandise himself by the plunder or renown of a foray beyond the frontiers. The ad-

[1] Tac. *Germ.* 5.: "Argentum et aurum propitii an irati Di negaverint dubito." This well-known assertion, so remarkably inaccurate, as it has proved, in fact, was provoked perhaps by the failure of the first speculation in Nassau mines. See Tac. *Ann.* xi. 20.: "Curtius Rufus . . . in agro Mattiaco recluserat specus quærendis venis argenti; unde tenuis fructus, nec in longum fuit."

ministration of the provinces became a matter of ordinary routine; it lost its principal charms in the eyes of the senators, who could at last with difficulty be induced to exchange the brilliant pleasures of the capital, with all its mortifications and perils, for the dull honours of a distant prefecture. Nothing is more significant of the actual improvement in the condition of the subject than this fact, which is advanced by Tacitus as a proof of the decay of public spirit and the degeneracy of the age.[1]

Vigilance of Tiberius in guarding the frontiers.

Nor can I discover in general the justice of accusing Tiberius of neglecting the safety of his remote possessions, which seem, on the contrary, to have flourished securely in the armed peace of his august empire.[2] In Gaul the revolt of Sacrovir and his Belgian confederates was effectually suppressed: the outbreak of the Frisians seems, though at some cost of blood, to have been speedily quelled.[3] Nor have we any distinct confirmation of the assertion of Suetonius, that Tiberius suffered the province to be ravaged with impunity by the Germans, which, if true, can apply only to some transient violation of the frontiers. That disgrace indeed to this extent actually attended the Roman government seems not improbable, from circumstances which have transpired regarding the conduct of the commander in those parts. For many years the legions of the Upper Rhine were confided to a senator of high consideration; but he was said to have gained the devotion of both his own soldiers and those of the lower

Gaul and Germany.

[1] Tac. *Ann.* vi. 27.: "Egregium quemque et regendis exercitibus idoneum, abnuere id munus." The distrust, however, or indifference of Tiberius was more distinctly shown in his keeping some of his governors at home for years after nominally appointing them. Such were the cases of Ælius Lamia and Arruntius. Tac. *l. c.*

[2] Suet. *Tib.* 41.: "Armeniam a Parthis occupari, Mœsiam a Dacis Sarmatisque, Gallias a Germanis vastari neglexit."

[3] Tac. *Ann.* iv. 73.

province, by the popularity of his manners and the laxity of his discipline.[1] Such conduct proceeded, we may confidently affirm, either from culpable negligence or from criminal aspirations. Tiberius was doubtless alarmed. Lentulus Gætulicus, such was the officer's name, was denounced by a delator; but his marriage with the daughter of Sejanus seemed a surer ground of attack than a charge of incapacity or treason. Tiberius pretended to listen to an accusation thus artfully framed, the senators were blinded, and Gætulicus was threatened with removal and disgrace. Undismayed, he addressed from his camp a letter to the emperor, urging that he had not sought connexion with the minister of any motion of his own, but at the suggestion of Tiberius himself; that if he had been deceived by the arts of the traitor, his fault was only the same as his master's: it was unjust that he should suffer for an error which had been in fact common to both. His loyalty, he protested, was unshaken, and so it would remain as long as he was himself trusted; but the arrival of a successor to his command he should regard as no other than a sentence of death, and to such he would refuse to bow. The emperor, he boldly added, might continue to rule the state, but he would retain the government of his own province. The rumour of so proud a defiance struck the citizens with astonishment; but Gætulicus kept his place, and the impunity which was thus accorded to a son-in-law of Sejanus engaged them to believe it. Tiberius, they whispered, knew well how deep was the general dissatisfaction with his rule; he was conscious also of the infirmities of age, and aware that his authority rested after all on opinion rather than on its own intrinsic force. He refrained from risking a collision.[2]

[1] Tac. *Ann.* vi. 30.: "Effusæ clementiæ, modicus severitate."

[2] Tac. *l. c.*: "Reputante Tiberio publicum sibi odium, extremam ætatem, magisque fama quam vi stare res suas." We shall see reason

Nor does the assertion of Tiberius's indifference seem to be better founded with regard to Mœsia. Tacitus steps frequently aside from his domestic narrative to record the affairs of this region and the exploits of the emperor's lieutenants; while Appian makes special mention of the conquest of Mœsia under Tiberius, and of the establishment of provincial government in this quarter by his hand.[1] Sabinus, Pandus, and Labeo seem to have held the command there successively during the first half of this principate, and these men at least were not allowed to indulge in indolence, for their exertions and victories are a theme to which the historian repeatedly refers. At a later period, indeed, we shall read of an incursion of the Roxolani, a people of Sarmatia, during a season of commotion at Rome, and this is not improbably the occurrence which Suetonius had actually in view.[2] Mœsia, in the reign of the second princeps, was one of the best appointed of the imperial provinces. Two legions were quartered in it, and a military road from the borders of Pannonia led along the bank of the Danube to the Euxine at Tomi, thus securing the communications of the presidiary cohorts through the whole length of the only exposed frontier. The north-eastern corner of the province, for the Romans did not care to occupy the pestilential marshes of the Dobrudscha, was also connected by a coast-road with Byzantium on the Thracian Bosphorus.[3]

Mœsia.

But the emptiness of these charges can be more clearly shown in the case of the dependent kingdom of Armenia, which, according to the same authority, Tiberius suffered to be seized by

Armenia.

at a later period to believe that the command of Gætulicus was really fraught with danger to the imperial interests.

[1] Tac. *Ann.* ii. 66., iv. 5.; Appian, *Illyrica*, 30.

[2] Tac. *Hist.* i. 76.—A.U. 823, A.D. 70. Comp. Suet. *l. c.*

[3] Bergier, *Grands Chemins*, p. 509.

the Parthians, and wrested from the patronage of the empire. It appears, on the contrary, from the particular recital of Tacitus, that the bold occupation of this kingdom by Artabanus was immediately resented by the emperor with the energy of a younger man. Not only were the wild mountaineers of the Caucasus, the Iberians and Albanians, invited to descend upon the intruders; not only were the sons of Phraates released from their long detention at Rome, and directed to present themselves on their native soil, and claim the allegiance of their father's subjects; but a Roman general, L. Vitellius, a man of distinguished valour and experience, was deputed to lead the forces of Asia and Syria against the enemy; and while it was hoped that a vigorous demonstration would suffice to hurl him back from the territory in dispute, instructions were not withheld, it would appear, to push on if necessary, and smite the Parthians with the strong hand of the empire. But these combinations proved speedily successful. Artabanus, already detested by many of his most powerful subjects, was compelled to descend from his throne, and take refuge in the far wilds of Hyrcania; while Tiridates, the son of Phraates, was accepted in his room. The army, which had crossed the Euphrates, returned victorious without striking a blow, though, by a subsequent revolution, Artabanus was not long afterwards restored, and admitted, upon giving the required hostages, to the friendship of his lordly rivals.

Thrace, Cappadocia, and Syria.

If Tiberius refrained from enlarging his empire by fresh conquests, he was not the less intent on consolidating the unwieldy mass by the gradual incorporation of the dependent kingdoms enclosed within its limits. The contests between two rival brothers, Cotys and Rhascu-

[1] Tac. *Ann.* vi. 31—37.; Joseph. *Antiq.* xviii. 5.

poris, in Thrace, gave him a pretext for placing the fairest part of that country under the control of a Roman officer, thus preparing the way for its ultimate annexation.[1] On the death of Archelaus, king of Cappadocia in 770, his country was declared a Roman province, and subjected to the rule of an imperial procurator.[2] At the same period the frontier kingdom of Commagene was placed under the government of a proprætor.[3] Syria, the great stronghold of the Roman power in the East, was still skirted by several tributary kingdoms or ethnarchies, such as Chalcis, Emesa, Damascus, and Abilene; but the dependency of Judea, the wealthiest and proudest of all these vassal states, had been wrested under Augustus from the dynasty to which it had been entrusted, and was still subjected by his successor to the control of the proconsul at Antioch.

Division of Palestine between the sons of Herod the Great.

Herod the Great, on his death-bed, had sent his seal, together with an ample present, to Augustus, in token of the entire dependence upon Rome in which he held his dominions. This act of vassalage procured him, perhaps, the ratification of the disposition he had made of his territories between Archelaus, Herod Antipas, and Philippus. To the first was allotted the kingdom of Judea, including Samaria and Idumea, but with the loss of the cities of Gaza, Gadara, and Hippo, which were now annexed to the government of Syria. To the second fell the districts of Galilæa to the west, and Peræa to the east of the Jordan; while the Trachonitis, Auranitis, and Gaulonitis formed with Ituræa the tetrarchy of Philip, extending northward to the borders of Damascus.[4] But the rival kinsmen were not satisfied with this

[1] Tac. *Ann.* ii. 67.
[2] Tac. *Ann.* ii. 42.; Dion, lvii. 17.; Suet. *Tib.* 28.; Strabo, xii. p. 534.
[3] Tac. *Ann.* ii. 56.
[4] Joseph. *Antiq.* xvii. 11. 4.

division. Archelaus and Antipas repaired to Rome to plead against one another; but while they were urging their suits before the tribunal of the senate, the provisional government which the Romans had established in Judea was suddenly attacked on all sides by bodies of armed insurgents. Their leaders, however, were not men of rank or commanding influence, and the revolt was in no sense a national movement. It was speedily crushed by Varus, then proconsul of Syria, the same who ten years afterwards perished so miserably in Germany, and punished with the atrocious severity too commonly employed in such cases.[1] Archelaus, confirmed in his sovereignty, continued to reign under these lamentable auspices in Judea. His subjects, still mindful of the sons of their beloved Mariamne, never regarded him with favour; and it has been mentioned how they complained to Augustus of his tyranny, and obtained his removal from the throne. He was finally sent into exile at Vienna in Gaul.

Disgrace and banishment of Archelaus.

The fall of Archelaus left the throne of Judea and Samaria without a direct claimant, and the emperor took the opportunity of attaching them to the Roman dominions.[2] This acquisition was placed under the general administration of the proconsul of Syria, but governed more directly by an imperial procurator, who took up his abode at Cæsarea Philippi. Of the character of the new government we find no complaints even in the Jewish writers whose accounts of this period have been preserved to us. Both Augustus and his successor appear to have instructed their officers to continue to respect the peculiar habits and prejudices of the

Judea annexed to the Roman empire.

[1] Joseph *Bell. Jud.* ii. 5.; *Antiq.* xvii. 10.

[2] Fischer (*Röm. Zeit.* a. 759.) fixes the annexation of the province to the last half of this year. Comp. Dion, lv. 27.; Joseph. *Antiq.* xviii. 2. 1.

Jews[1]: whatever may have been the ordinary severities of Roman domination, it was not till the arrival of Pontius Pilatus, about the middle of the reign of Tiberius, that any special grievance was inflicted upon them. They complained that the new procurator commenced his career with a grave and wanton insult. He entered Jerusalem with standards flying, upon which, according to the usage of the time, the image of the emperor was displayed. The old religious feeling of the Jews against the representation of the human figure was roused to indignation: they remonstrated with the procurator, nor would they listen to his excuse that the Romans had their customs as well as the Jews, and that the removal of the emperor's portrait from his ensigns by an officer of his own might be regarded as a crime against his majesty. But if Tiberius was merely the creature of the delators in his own capital, in the provinces he retained his good sense and independence. Perhaps it was by a special authorization from him that Pilate consented to withdraw the obnoxious images.[2] Nevertheless, the Jews, under the guidance of their priests, continued to watch every act of his administration with inveterate jealousy, and when he ventured to apply a portion of the temple revenues to the construction of an aqueduct for the supply of their city, broke out into violence which provoked him to severe measures of repression. Mutual exasperation led probably to further riots, followed by sanguinary punishments: the government of Pilate was charged with cruelty and exaction, and at last the provincials addressed themselves to Vitellius, the governor of Syria.[3] Nor were

Government of Pontius Pilate.

[1] Philo, *legat. ad Cai*, 38.

[2] Joseph. *Antiq. Jud.* xviii 4. 1.; *Bell Jud.* ii. 9. 3.

[3] Joseph. *Antiq Jud.* xviii. 5. 2.: καὶ Πιλᾶτος, δέκατον ἔτεσιν διατρίψας ἐπὶ Ἰουδαίους, εἰς Ῥώμην ἠπείγετο, ταῖς Οὐιτελλίου ἐντολαῖς οὐκ ὂν ἀντειπεῖν.

their expectations disappointed. The proconsul required his procurator to quit the province, and submit himself to the pleasure of the offended emperor. Tiberius, indeed, was already dead before his arrival, but the new ruler attended without delay to his lieutenant's representations, and Pilate was dismissed with ignominy to Vienna.[1] From the confidence with which Tiberius was appealed to on a matter of such remote concern, it would seem that the vigilance of his control was not generally relaxed even in the last moments of his life.

Recall and banishment of Pilate.

While Judea and Samaria were thus annexed to the Roman province, Galilee and the outlying regions of Peræa and Ituræa were still suffered to remain under their native rulers; and the dominions of the great Herod became, as we shall see, once more united transiently under a single sceptre at no distant period. If, however, we consider the condition of the Jewish provincials under the Roman fasces, we shall find reason to believe that it was far from intolerable, and presented probably a change for the better from the tyranny of their own regal dynasties. Doubtless the national feeling, as far as it extended, was outraged in its cherished prepossessions by the substitution of a foreign for a native domination. The nobles and the priests, who preserved and reflected this sentiment, and who suffered in consideration under foreign sway, fostered the prejudices of the people to the utmost, excited their discontent, fanned the flame of sedition, and then betrayed their clients to the sword of relentless executioners. It may be admitted that the fiscal exactions of the procurator were more uniformly rigid than those of Herod, whose remission of a large portion of his people's taxes had gained him favour in the midst of his atrocities. Yet the amount of free-

Condition of Judea under the Roman government.

[1] Joseph. *l. c.*; Euseb. *Hist. Eccl.* ii. 7

dom and security enjoyed by the Jews under a Quirinius and a Pilate shows the general leniency of the Roman government at this period. The warm descriptions of provincial felicity by the Jewish authority Philo, which will be cited hereafter, may be coloured to suit a purpose, and it may be impossible to produce any distinct facts to support this general conjecture. Yet indications are not wanting in the writings of the Evangelists, which contain, abstracted from their religious significance, the most interesting record in existence of the social condition of antiquity,—for they alone of all our ancient documents are the productions of men of the people,—to show that the mass of the population of Judea was contented and comparatively happy under the rule of the Roman procurator.[1] Such is the impression I receive from the representations of common life in the Scriptures of the New Testament. The instances they allege of cruelty and injustice are drawn from the conduct of the Jews towards one another, rather than of the foreigner towards the native. The Scribe and the Pharisee are held up to odium or contempt, not the minister of police or the instrument of government. The Romans are regarded in them as the protectors of the people against their domestic tyrants. The duty of paying them tribute is urged as the proper price of the tranquillity they maintain; their fiscal officers are spoken of with forbearance; their soldiers are cited as examples of thoughtful toleration; the vice of the provincial ruler is indifference and unbelief rather than wanton violence; and the tribunal of the emperor himself is appealed to as the last resort of injured innocence. The freedom of movement enjoyed by the subjects of Rome, the permis-

[1] These writings refer in point of time to the middle of the reign of Tiberius. The dates variously assigned for the Crucifixion range from A. D. 27 to A. D. 33. Clinton fixes it at A. D. 29, A. U. 782, the sixteenth year of Tiberius.

sion so fully allowed them of passing from town to town, from frontier to frontier, of assembling together for social and religious objects, of flocking in crowds into the city or the wilderness, at the call of popular leaders or preachers, all indicate a state of personal liberty which might be envied throughout the continent of Europe at the present day.[1]

[1] It may be said perhaps that this indulgence was owing to the want of means of repression rather than of the desire to repress. The imperfections of the police of the empire, from the slenderness of its military force, were compensated by the severity of its punishments.

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